

SIERRA CLUB BULLETIN

March
1948

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Sierra Club Bulletin

VOLUME 33

MARCH, 1948

NUMBER 3

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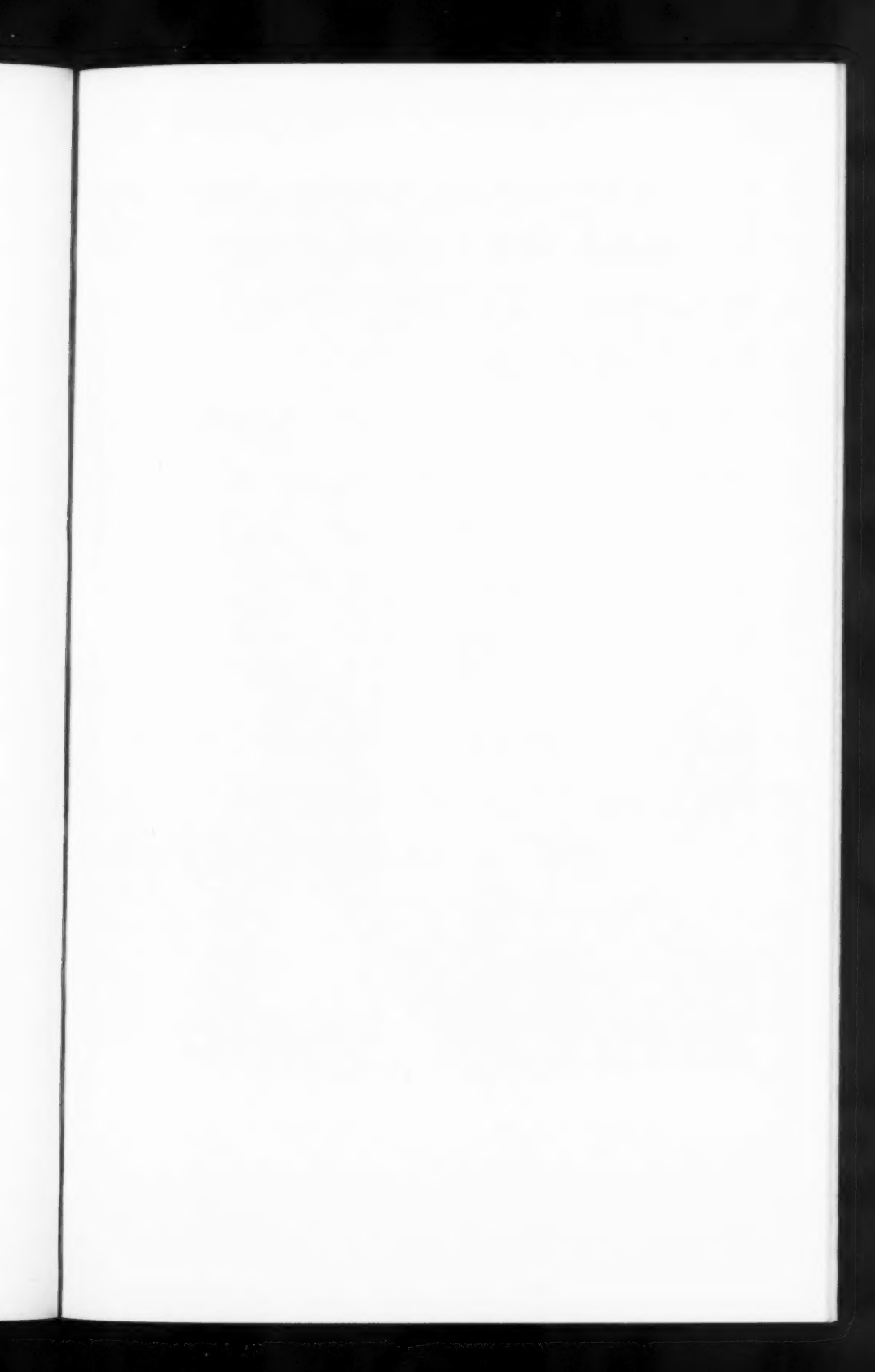
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THIRTY-TWO PAGES OF PLATES AND ONE COLOR FRONTISPICE

Published monthly except August by the Sierra Club, 2061 Center Street, Berkeley 4, California. Annual dues are \$6.00 (first year \$12.00), of which \$1.00 is for subscription to Sierra Club Bulletin. Entered as second-class matter at Post Office, Berkeley, under Act of March 3, 1879. Contributions and changes of address should go to address above: communications on matters of club policy should be addressed to the Secretary, 1050 Mills Tower, San Francisco 4.

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Printed in the United States of America by James J. Gillick & Co.





MOUNT WADDINGTON: THE 6,000-FOOT NORTHEAST FACE
Kodachrome by Oscar A. Cook

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Sierra Club Bulletin



VOLUME 33

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Waddington Country—1947

By ROBIN HANSEN

Empty heads and tongues a-talking
Make the rough road easy walking . . .

—A. E. HOUSMAN

WHEN THE FAINT droning of the plane had grown until it filled the valley with its reverberations, and the first package, brightly be-decked with yellow ribbon, appeared out of the cargo door, we knew we had won. The months of planning, the hectic buying in Vancouver, the race against time getting into the area, and the prayers for flyable weather had not been in vain. We had arrived, with a complete supply of food and equipment, in the heart of the Coast Mountains, close to Mount Waddington, highest and most difficult peak in British Columbia.

We had heard much about the Stiletto-Dentiform Ridge, how it resembled the famed Chamonix Aiguilles, and how, although a few parties had seen its many summits, no one had as yet approached them. Now they were at hand.

This region easily caught our fancy and we had spent the spring and early summer of 1947 in planned and impromptu meetings, deciding upon equipment, supplies, and the most advantageous approach. Like most college students, we were handicapped by a limited amount of money, but this was not readily apparent until we received a letter from Mr. W. A. Munday, discoverer and foremost explorer of the region, stating that our proposed route down the Homathko River was impracticable for men on foot. He said that horses would be necessary for crossing the three glacier-

fed tributaries of the main river. Although he would not say our plan was impossible, he did say that its success was improbable. Our budget would not allow the hiring of horses; nevertheless, after an emergency meeting, we voted to try it on foot. A horse, after all, has certain physical advantages, but does lack the ability to rig Tyrolean traverses across glacial torrents.

The approach to the region begins, for all practical purposes, at Bluff Lake. Here, five hundred miles from Vancouver, the road ends and the trail begins, sporadically following the course of the river, and terminating fifty miles away at the Scimitar Glacier. Distance here is better measured in hours and days, as Don Munday says. We planned on five days' walking time to reach our proposed base camp at the forks of Scimitar and Cataract creeks. Obviously this great distance called for some method of transport for our ton of equipment and supplies, else we would have spent the entire summer in backpacking and relaying. We cast about for the least expensive method of having it done, and settled on an air drop, after receiving a reasonable offer from Queen Charlotte Airlines, of Vancouver. They offered as well to drop two of us at Twist Lake, within two days of camp. This appealed to the mountaineer in us, for what, after all, is as distasteful to a climber as a long backpack? Thus came about the first of our many lotteries. We drew lots to see who would guide the plane to the rendezvous. Later we were to descend to drawing for the use of one of the air mattresses or for an extra cup of soup, and it would be enlightening to many to see the look of expectation on eight grown men drawing for one small butterball.

Those eight of us on the expedition were a reasonably diversified group, —all from either California or Stanford, and all members of the Sierra Club. First, Oscar Cook, the scientist always. He was in charge of dividing the ration each day and insisted on doing this with scientific complexity. Never would it be a cup or a handful of anything to go into the pot, but always a fifth of an eighth of the package or some such figure. Dick Houston could never understand such high-powered mathematics, being at heart a forester. His pleas that Oscar tell him how much in *cupfuls* will live long in our memories. Fletcher Hoyt, youngest on the trip, was also the cleanest and most methodical. He could be found on any off day washing his gear and airing his sleeping bag. Fritz Lippmann, however, had never, on any of his previous mountaineering jaunts, been known to wash—on the theory that natural oils and dirt have some protective and insulative value. I sided one hundred per cent with Fritz's theories and was consequently elected to share the same tent. Howard Parker was

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(Shortage)

second to none in keeping up our spirits with an inexhaustible supply of jokes and songs. Bud Gates was master of cookstove and limerick, as well as being the possessor of a pair of forty-dollar climbing boots, never used for fear they would get scratched. Ulf Ramm-Ericson was chief map-maker and spent all of his spare time adding to and correcting the Munday sketch map of the region. How he smuggled in all the pencils and other paraphernalia of his trade we will never know.

Al Baxter, who didn't get to go because of injuries suffered when he fell while climbing in Yosemite, was with us in spirit, and we are grateful to him for his help during the preparations for the trip.

The timetable was set: On August 8, Bud and I were to guide the plane to the drop area, and the rest were to leave Bluff Lake six days early in order to be on hand for the drop. We felt that this was imperative because (1) we wanted to be absolutely sure where the supplies were dropped, and (2) we didn't want the indigenous wildlife to beat us to the dessert.

Vancouver was the scene of harried buying and packing for the three days before departure time. With the help of Mr. Stanley T. V. Jeffery, Chief Purchasing Agent of the Canadian Pacific Railroad, we managed to get such things as were in short supply. The hospitality of Vancouver could not have been surpassed.

The road then led north over what the Canadians term a highway, but what seemed to us just a way. The advance party of six started out on macadam and ended up five hundred miles and two broken springs later on what would have sorely tried a High Sierra burro. Here the supplies and equipment were separated and the usual forty-pound pack evolved. The spring scales, however, read sixty to eighty pounds, and at first lift the boys were inclined to doubt them. An hour and a half later, while trying to get the packs on after the first rest, the party was sadder and wiser, and was to find that only in the morning could they hoist the loads on; the remainder of the day they stooped to conquer. They met with every conceivable situation, from Dick's falling headfirst into an icy creek to Howie's being stuck so deep in what was called a meadow that help had to be forthcoming before he could move on. All six were now ready to define misery as being on a hummock in the middle of a swamp after wading through water for three hours. This was the low point of the trip. Oscar insisted that the group stay on one side of the Homathko, thus avoiding the difficult crossing. Once, when the trail had completely disappeared, he plunged ahead and came back a few minutes later announcing that he had found an Indian trail. Off after him the party went, against the wishes of those who felt they could engineer the river. It was later

found that the last Indians in the valley were those who had massacred Alfred Waddington's party in 1863; the trail was no longer even what they had left it. Time was slipping by and Ulf kept urging everyone to meet the schedule. Base camp was made on the afternoon before drop day.

Here the advance party received a rousing welcome from four of the Harvard Mountaineering Club's expedition, Graham Matthews, Fred Beckey, Francis P. Magoun, III, and Bud King. They treated us to a sumptuous meal. Some weeks earlier we had learned that they were going to precede us into the region and we had hoped that they would not have finished all of the first ascents by the time we arrived. We told ourselves that firsts were not a primary concern of the mountaineer—but we had not completely convinced ourselves.

We had also learned of the death of Charles Shiverick in a snow avalanche on Mount Serra. The advance party offered help in the evacuation that the family wished or in providing for burial; help was not needed, however, as it was later decided that evacuation was too dangerous, and the Harvard party carried out the burial alone.

Our men were up at dawn the next day waiting for the plane, but not a sound was heard. That evening rations were cut to the bone. The party knew that if the plane did not come the next day, there would be a long wait; it was chartered elsewhere for the remainder of the week. There were six fervent prayers drifting in the still air that night. Breakfast was neither in good spirits nor of sufficient food.

But at ten o'clock on August 9 the plane was heard and the signal mirror was brought into the sun. It was with great relief that the men saw the *Norseman* turn up the valley and swoop low over camp. The bundles came tumbling out and would hit the boulder-studded sand bar, bounce a few feet in the air and come to a stop. Within fifteen minutes the plane wiggled its wings and roared away to drop Bud and me at the lake.

Now came the job of unpacking and sorting the food and equipment. No sooner had the first bundle been opened than there came a sinking feeling. Jam! Jam had been packed in every bundle and in every bundle it had exploded. Our menu problem was solved; the food was thoroughly mixed. For the rest of the trip we had jam yesterday and jam tomorrow, but never jam today.

When commissary had finally been made as shipshape as possible, Fletch and Ulf announced that they were going to attempt Mount Projectile (*circa* 9,800 feet), which dominated our campsite. Its base was only half a mile away, and its unclimbed summit tower glistened in the sun a vertical mile and a half above. Fletch, afraid that he would oversleep,

decided to stay awake all night and thus make sure they got away on time. His heart was in the job, but his body succumbed to sleep at 2 A.M. He was awakened by the sound of cooking—for breakfast at eight. They did, however, get away at three the next morning.

"The first five thousand feet was nothing more than talus walking up a granite couloir," Fletcher said in describing the ascent, "but when we came astride the prominent ridge and got our first unforeshortened view of the two-thousand foot final tower, we knew that it would be no easy day for a lady. Ulf led off and for the next five hours we switched leads and forced a way up the long pitches in a series of ascending traverses. The climbing was good and was on the verge of requiring pitons at several places. At three in the afternoon we stood on the summit and were able to relax for the first time in twelve hours. The panorama seen was reward enough. We could look down and see Scimitar Creek far below. The Scimitar Glacier stretched unending to the southwest, disappearing behind the black shoulder of Mount Hickson. Directly across the valley and on our level the Stiletto-Dentiform Ridge came into view as the cloud covering momentarily gave way. We spotted many of the fine summits surrounding the upper Tellot Glacier and looked forward to trying them. It was four when we rapped off and started down for camp."

Upon their arrival in camp they found that Bud and I, lately come from the delights of the upper Homathko, were on hand to welcome them. Our party was now complete and we laid plans for the establishment of the high camp on the Upper Tellot Glacier, where we would be in good position to go for our objectives. Bud, Oscar, Dick, and Howie were to relay a load to Brown Rock, halfway up the Cataract Glacier, and proceed to the top of the col the next day. Fritz, Ulf, Fletch, and I were to explore the Scimitar Glacier and go as far as Fury Gap to see if this might be a practical approach to Mount Waddington. After an all-day walk, backing and filling our way here and there around and over the many crevasses and moraine mounds, we came to a likely camp. We hacked away at the ice until we had a fairly level spot and melted camp in.

We came within sight of Fury Gap shortly before noon the next day. The impracticability of packing over the gap at this time of the year was apparent. Fritz and I shouldered our packs and set off for Base Camp, leaving Ulf and Fletch to try their luck on a near-by peak. We got into camp at nine that night and, after supper, relaxed in front of a roaring fire. We were dead tired and looked forward to the tough carry to High Camp with anything but happy thoughts.

After we had had ten hours of sleep, however, the packs appeared to

have gotten much lighter. We stuffed ourselves on pancakes to be sure that we at least took the memory of a good meal to the wastes of the upper Tellot. The trip to Brown Rock was uneventful save for the bear lying smack in the middle of an unavoidable part of the route. It had been shot by the Harvard group two weeks before and the odor had been gaining momentum ever since. Our feet took wings.

We arose before sunup, after a bivouac at the Rock. We wanted to pass the dangerous section of the icefall during the cold of the morning and also to get as high as possible before the snow softened and we began to sink in. The route through the icefall was not complicated, and we made good time. Higher, however, the snow softened in the heat of the sun and the climbing became a grind. At one that afternoon we spotted the top of the col and judged it—for the first of many times—to be two hundred yards ahead. It hovered tantalizingly out of reach for the next two hours. When we finally did arrive at the col we saw camp not far away. The setting was Himalaya-like, with the tremendous faces of Mounts Merlin, Fascination, and Munday dropping in great ice-covered swoops to the Tiedemann Glacier six thousand feet below. It was a Sella photograph come to life.

The other four came trooping in to camp an hour later with tales to tell of their exploratory walk to the Claw Peaks, a mile to the south. The sun went down as we were cooking dinner and the cold began to penetrate. Hands disappeared into gloves and parkas blossomed out in full force. The wisdom of long johns, which we had begun to doubt during the long climb in the heat of the day, became apparent. The more hardy ones stayed up for a last cup of tea, but the rest of us burrowed into the snugness of our down bags. Fritz and I had drawn the leaky air mattress and were in the throes of attempted repair. The best we could do was to slow the leak down to a rate of only two flats per night.

It was relay day again. We were to bring up a last load from Brown Rock. This would give us ten days' supply at high camp. There was only enough food at the cache to give four men 45-pound packs, so the *n*th lottery gave Fritz and Bud a chance to climb Mount Dentiform, done two weeks before by Harvard. Those of us doomed to the pack train were away at nine, and the ease with which we sped down the col gave us a feeling of exhilaration. How short is memory! Upon reaching the icefall we could see Ulf and Fletch, on their way back from an unsuccessful attempt on an unnamed peak between Scimitar and Parallel glaciers, threading their way through the heavily crevassed area immediately below. As we came within hailing distance we could see that they were staggering

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MOUNTS ASPERITY AND TIEDEMANN, FROM MOUNT ARGIEWICZ

In the Coast Ranges of British Columbia

Eight Photographs by Fletcher Hoyt





THE STILETTO—DENTIFORM RIDGE



ON THE ROUTE TO HIGH CAMP: CATARACT GLACIER

UPPER



UPPER TELLOT GLACIER





HIGH CAMP II, 10,200 FEET, UPPER TELLOI GLACIER



ON DRAGONBACK

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under very heavy packs. They had elected to go all out and take everything in one shot. We pointed out the route to high camp and stood for awhile watching their painfully slow progress as they got onto the steep slope of the icefall. At the cache we divided up the loads and were soon back at the grind. We overtook the others at the halfway mark and the look of abject misery on their faces gave us new strength. We pulled into camp at four and busied ourselves storing the food in the tents. We kept everything under cover in case of storm.

It was well after dark when we heard yodels announcing that Fritz and Bud were returning. Dick made a supreme effort and reached out of the sleeping bag to light the primus and warm soup for them. He was further persuaded to take a check on the temperature. The reported seventeen degrees gave an added chill to the night air. As the jubilant pair walked into camp and unroped they gave an account of their ascent of Dentiform by a new route on the northeast face. It had required three pitons for safety and the fifty-five degree snow at the base had made it a fine climb. They also reported that, in their opinion we ought to move camp to the base of the Stiletto-Dentiform Ridge. We were two hours from our objectives and the difficulty of some of our proposed climbs made it imperative that we move camp closer. They had glowing tales to tell of Stiletto Needle. Harvard had been on it that day and had been forced to retreat. This was a real challenge to the rock climber in us and we made plans for shifting camp the day after next. We had been packing here and there for the past five days and wanted the next day for an attempt on the unclimbed "Second Claw."

Dick, Fletch and I were away at 5:15 A.M. with the jeers of the lazier members ringing in our ears. We stopped to rest at six and enjoyed that always breathtaking sight, sunrise in the high mountains. Why is it that the logic of an early start is seen only after one has been up a half hour?

We reached the bergshrund before the sun had gotten around to it, and made a delicate traverse on a paper-thin, frozen snow bridge paralleling it. We reached the rock as the rays of the sun reached us. The upper portion of the "Second Claw" did not look feasible so we were not really disappointed when we found ourselves at the summit pitch of the "Third Claw." I was elected to lead the pitch and got in one piton for protection ten feet up. I tried every combination to make it without artificial aid but was forced to use a piton and sling. Even then it was a hard go, one of those mantleself affairs with very little shelf. We tarried on the summit for an hour, enjoying the view and searching for a route on the "Second Claw." Its unsound rock was uncompromising, our number of

pitons was limited, and we turned our thoughts elsewhere. Roping off, we began the descent, climbing down the easier pitches.

The rest of the day was spent in attempting a small rock peak on the way to camp, but we were turned back by a bergschrund that offered but one possibility of crossing. This was guarded by a hanging cornice that was clearly in danger of avalanching. We returned to camp in time to share some of Fritz's Tellot juice—powdered milk mixed with any kind of Jello at hand. The color ranges from light pink to violent purple and it is actually good to drink as well as to Kodachrome.

On August 18 we established Camp II at 10,200 feet. The route, which lay up a snow-covered icefall, was only too obvious since, owing to the lateness of the season, the crevasses had a limited number of fast-disappearing snow bridges. Packs were up to the usual fifty pounds and belays became of the utmost importance. Falling into a crevasse any great distance can easily result in the loss of the pack, and loss of a sleeping bag and tent at this altitude and latitude can prove disastrous. Care had to be our watchword throughout the trip. Along the way, and to guide us back in case of low visibility, we reset the Harvard willow wands a rope-length apart and then stopped at the Harvard camp for a rest. We looked the area over and decided to cross a small rise and place camp at the very base of our peaks.

No sooner had the tents been pitched than it began to snow. It came down all that day and when we awoke to find it still snowing we wondered whether we were in for one of the infamous storms of the Coast Mountains. It cleared at ten and the sun shone brightly but was without heat. The temperature had been dropping steadily and now stood at 24° F. With a cup of hot Jello to fortify us, we had a look around. Six inches of powder snow had fallen and difficult climbing was out of the question. For the next few days we climbed peaks we judged to be safe, among these being Mills Tower, Eaglehead, Dragonback, and Dentiform.

On the third day we felt it was permissible to get on some of the more difficult peaks. Bud, Fritz, Oscar, and Howie wanted to try unclimbed Stiletto Needle while Ulf, Fletch, Dick and I chose the fifth peak of Serra. Fritz describes their climb:

"We descended the gully between Stiletto and Serra and regained altitude by ascending a small, steep couloir that ended at the base of the climb. We were now in position to launch an attack on the Needle proper. I led off and in a few minutes the first crumbly pitch was behind us. We looked down and could see our second rope engaged in conversation with Francis P. Magoun, III, and Bud King, of the Harvard party, who had

wanted to join up with us. Oscar and Howie offered their second position to the other two. All of them were soon under way. With the aid of the fixed rope I led over the smooth slab, now covered with half a foot of new snow. Past this obstacle Magoun and King changed to tennis shoes, but Bud and I used our Lugs all the way and found them most satisfactory. Two long pitches and two pitons later we came astride the ridge that separates the Needle from Stiletto proper. The route continues upward around the spire, truly a spiral staircase. We were now out on the exposed north face and our difficulties commenced. Bud Gates placed two direct aid pitons and rope-traversed around the corner. Suddenly he cautioned me to be ready for a fall. There was a tremendous clatter and I saw a large block go hurtling toward the snow. He had had to clear a dangerously loose block from the route. I followed around and found Bud perched on a precarious chockstone whose equilibrium seemed in favor of gravity more than friction. We were glad to move ahead. The next short pitch required three switches of lead before Bud summoned his last strength and traversed a bit to the left, which avoided the awkward pull up, and allowed him to step over to the ledge. I brought up the Harvard pitons. It now commenced to snow and we debated turning back. We hunched in under an overhang and decided to wait it out, since we were fairly well protected. When the storm had passed Bud again took the lead and was soon pounding in direct-aid pitons on the summit pitch. From the second sling he had his first view of the summit. He struggled for minutes to leave the sling but couldn't. He called for slack but needed tension. A shorter step loop enabled him to slide onto the sloping summit. I joined Bud on the summit, followed by King and Magoon. Oscar and Howie had turned back during the storm to give us a greater margin of safety in case of hurried retreat. We had a moment of victory on the summit, but freshly gathering clouds and dusk forced us to descend."

Ulf, Fletch, Dick, and I were also successful on Serra's fifth summit. There were two nice snow traverses, and some beautifully exposed scrambling on the route. We named it for David Wilson, a squadron mate of mine, killed in action during the war.

We were all elated by the success on the Needle, for we felt that this was rock-climbing of a high degree for such cold.

We were thoroughly lazy the next day and stayed in the tents, absorbing the heat of the sun until hunger forced us to action. Our two menus were not things of joy, but of necessity: noodles, cheese, spam; spam, cheese, and mashed potatoes—in never-ending succession. Our cooking added spice to neither. We made a few more climbs the following two days,

among these were Mounts Tellot, Shand, and Argiewicz. This last peak we named for Art Argiewicz, who had climbed with some of us before the war, and who was killed in action with the Mountain Troops in Italy.

Time, we noted with regret, was growing short. Gathering our things together, we made a cache on the east ridge of Dragonback of our surplus of nearly a hundred pounds of nonperishable foods, and almost five gallons of white gas. This we named Shiverick Cache, and it is for the use of anyone in the area who happens to need it. Then we shouldered the inevitable packs and headed home.

SUPPLEMENTARY NOTES

Footgear—We all wore Goodyear Rubber Company Lug soles—the rubber-cleated outsole developed for the army from the Bramani pattern—on our climbing boots, and found them superior to nails in every respect. These are radically different from nails, being of molded rubber. Some of the advantages are: superior friction on rock; ideal heat insulation on ice and snow; a minimum of balling; good wearing quality; a cushion effect; and, surprisingly enough, as good a grip as nails on snow and rough ice. On smooth ice nails are slightly better; but crampons would probably then be needed, and are more easily fitted to Lugs than to nails.

Weather—From all reports we had gathered on weather in the region, we were prepared to spend a good deal of the time in the tents due to rain and snow. That this did not happen was not, we believe, solely due to luck. Few parties, to our knowledge, have ever been in the area during August and September, which this year were dry, only one and a half days out of our thirty having been snowy. Even at that, one of the lowland trappers said, "Too bad you had so much snow. Usually August is good."

Cost—One of the remarkable features of our trip was its low cost. From Bluff Lake to Bluff Lake, for a month of climbing, the cost was \$110 per person. This included all the food, the expendable equipment, and—the air drop. This should show that the Coast Mountains are not as remote as most persons may expect.

Wildlife: Conserve, Manage, or Lament?

By MILTON HILDEBRAND

IT HAS BEEN my experience that people who like to hit the trail are invariably interested in wildlife. Every Sierra camper has looked up from his sleeping bag to see a scolding chickaree dropping pine cone scales from a tall tree. And who has not paused at a turn in the trail to admire the grace of a buck bounding up a steep slope, or to watch a nervous chipmunk jerking its tail as it chatters on a stump? It is second nature to look for trout in every pool, and we count it a treat if we catch a glimpse of a weasel, or grouse, or marten. Even after dark, the yap of a coyote, the zoom of a nighthawk, and the rustle made by a scampering mouse are all familiar sounds. The back country would not be complete without wild animals. We want them to be there when we go camping. We would miss them badly if they should disappear.

In California, the history of the elk, wolf, grizzly bear, beaver, sea otter, wolverine and antelope makes it clear that we dare not take the presence of our wild friends for granted. In this respect I have found it helpful to ask myself several questions about conserving them. What, to begin with, do I mean by the conservation of wildlife? Which animals interest me, as a conservationist? What is the present status of these animals? What about predator control? Above all, how does wildlife conservation relate to basic conservation planning?

To answer the first of these questions I have found it instructive to distinguish between wildlife conservation and wildlife management. The former seeks to leave animals alone in their natural surroundings; the latter tries to encourage certain animals by direct methods. Management of California's antelope and beaver includes trapping the animals where they are numerous for release in other areas. The artificial feeding of deer and elk on their crowded winter ranges has been tried, and quail and pheasant are raised on game farms for release in the wild. Usually, the most effective way to manage wildlife is to make the environment more suitable. Examples are the controlled circulation of water in nesting marshes to destroy botulism, or "duck disease," and the alteration of stages in plant succession by plowing, selective cutting, or controlled burning to increase game food plants.

In parts of the Coast Ranges, the abundance of quail is determined by summer water supply. The Division of Fish and Game has developed automatic drinking stations which have increased local quail populations

ten times or more. This illustrates another important difference between conservation and management. It is the objective of conservation to maintain natural population densities. Wildlife is valued for its very presence as a part of the wild scene; conservation is therefore desirable in wilderness areas. Management seeks to provide a surplus. Game is a crop of the land. It is valuable only when harvested for sport, meat, or fur. Management is desirable over the country in general, and can be integrated with nearly every sort of land use. Indeed it has been emphasized in recent years that if the land is put to that use for which it is best suited, be it pasture, truck garden, corn, timber, or orchard, and if sound land-use principles are applied in each to prevent overgrazing, pollution, leaching of the soil, and erosion, then wildlife will invariably benefit immensely, even without such relatively expensive aids as game farms, feeding stations, refuges, and wardens.

I am interested in nearly all sorts of wildlife, but as a conservationist I need not worry about hummingbirds, fence lizards, shrew-moles, or a host of other species because they do quite well for themselves without any attention from me. I prefer also to limit my concern to native Californians. Exotic species do not seem to "belong" in our wilderness, and they are often poor risks. There are exceptions. The opossum, fox squirrel, and bullfrog have fitted fairly well into our faunal community; and the pheasant has made a good immigrant too, although I am content to let the hunter finance its naturalization. The useless and predaceous carp has made a less desirable citizen because it has become a serious enemy of lake trout, perch, and other native fish. The introduction of the mongoose is strongly opposed for fear that it would disturb the ecological balance here as it has done in Hawaii and in Cuba.

Having decided, after a consideration of wildlife management, that conservation is concerned with normal population densities, I can also strike the deer off my list. Unlike most large animals, it thrives upon our civilization. It is much more abundant now than it was in the days of the pioneers. It has become a domestic crop with an annual harvest, in California, of nearly 50,000 animals. The hunter and the Chamber of Commerce will watch over it. There are more than fifty areas in the state where overstocking by deer is rated as critical. I am therefore in sympathy with the current program of the Division of Fish and Game to reduce the number of game refuges.

What is the present status of the animals which need the continuing or increased attention of conservationists? I can mention only a few.

The Sierra Nevada bighorn, which once ranged from northern Yosemite

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to southern Sequoia, is now restricted to small bands between Sawmill Pass and Army Pass. These rock climbers must be rigidly shielded from poachers and domestic sheep. Several possible methods of returning the sheep to the northern High Sierra have been suggested in the *Yosemite Nature Notes* and in the *Sierra Club Bulletin*. For the present the animals seem to be hanging on, and there is reasonable hope that they may again become abundant over much of their native range.

The sea otter was thought to have been exterminated until a herd of about 150 animals was reported off the Monterey coast in 1938. They have been carefully guarded, and in March of 1946, 293 animals were counted. In recent months the presence of sea otters has been reported along the Mendocino coast near Russian Gulch. This increase and expansion is certainly very encouraging.

Some species bear close watching, although their status is not precarious at the moment. The California sea lion has been eliminated from many of its former breeding grounds. The big bulls were formerly killed to make medicinals for Chinese aristocracy. The animals are constantly in demand for circuses and shows; and about 400 were slaughtered last year for the manufacture of meal. They are protected from the general public, but fishermen may kill them when the animals molest their nets. Fortunately, the Bureau of Marine Fisheries conducts an accurate annual census, and we know that the herd is maintaining itself. The recent so-called "epidemic" killed only about 250 animals.

The record is not so good for some of our fur bearers. In 1924 Joseph Dixon wrote, "We can do nothing and permit the fisher and the marten to go the way of the passenger pigeon. We can wait a few years longer . . . and then put on a long closed season We can, best of all, put on a short closed season *now* The writer therefore strongly recommends . . . that marten, fisher and wolverine be given a three-year closed season in California." Nothing was done. In 1926, Grinnell, Dixon, and Linsdale estimated that there were only 300 fishers remaining in the state; and in 1933 the same experts believed that only fifteen pairs of wolverines were left in the Sierra. In 1942, E. R. Hall wrote, "The fisher in California is near extinction. A closed season longer than three years now will be required to replenish the stock." Still nothing was done. The first closure for fisher and wolverine came in 1946! A limited closed season for marten was granted the same year. It would have been infinitely easier to help these animals if we had started sooner.

What about predator control?

Predator-prey relationships present some of the most complex of wild-

life problems. The literature on this subject is immense, and ranges from the analyses of experts to the claims of designers and the opinions of fools. Apprehensive for my own classification I shall only mention a few considerations which are sometimes overlooked.

The emotional factor is great. "Predator," "varmint"—the very words make one shudder. Countless animals die because of this stigma. Last year an organization in California sponsored a predator-control contest, and awarded prizes to the brave captors of (among others) 41 weasels and 392 owls. It would be very difficult for this group to prove that these animals were more harmful than beneficial. Because no one else will, the conservationist should stress the esthetic values which many persons perceive in the glimpse of a predator deep in the woods, or in the sound of a howl in the night, or even in the knowledge that wild animals are there—an integral part of a natural community. He must, however, view this somewhat emotional factor objectively in order that he may weigh it against other considerations. This is difficult to do, and some friends of the wild fail as completely as the most rabid of predator haters, although in a different direction.

Certain animals must give way as human settlement advances because they are incompatible with civilization. The grizzly bear ranged down into the fertile valleys where few of us would want such a powerful creature about our homes or farms. The plains wolf, which probably once had a range approximately coextensive with that of our mountain coyote, had to go from the foothills for the same reason. These fur bearers were slaughtered sooner than necessary, however, and even today might be acceptable in our high mountain parks.

It is too often assumed that predators control the animals upon which they prey, and will destroy them entirely if not held in check. This naïve thought is behind bills now in Congress which would require the National Park Service to kill the wolves at McKinley, purportedly to save the Dall mountain sheep from local extinction. The wolves *do* kill sheep, and the number of sheep *did* drop from nearly 10,000 in 1928 to about 500 in 1946, but it should not be assumed that these facts are directly related. To learn the breeding potential of the sheep herd we must know the sex ratio (they are polygamous), the number of ewes which are followed by lambs each spring, the survival through the first critical winter, and the reproductive life span. Do eagles, accidents, and diseases take many sheep lives? Storm and crusted snow killed nearly nine animals in ten during the winters of 1928-29 and 1931-32. If we may assume that the vigorous young animals were best able to withstand the cold and hunger, then we

have a plausible reason for a further decline in the herd in recent years as this age class rounded out its life expectancy. Do the wolves prey upon all age classes alike, or do lambs or old animals comprise most of the kills? The wolves seldom kill sheep when caribou are available, and the marmot is also a buffer species. How long do the marmots hibernate, and what are the migration habits of the caribou? The answers to these and to many other questions indicate that the wolf has not, and probably will not, play a significant role in limiting the sheep herd.

If the loggers of the Olympic Peninsula are granted permission to cut their remaining virgin timber, they will do so. They know that the supply will last a little longer, and that when it is gone they, or their sons, can go elsewhere, or can seek other livelihoods. Nature must play a broader hand. If the wolves, for instance, of any given region destroy, or even seriously reduce the numbers of the animals upon which they feed, they must die. They cannot turn to eating duckweed or ants, and they cannot go elsewhere because there are already enough wolves in other suitable wolf habitats. Predators know all about sustained yield.

The evaluation of the coyote in California is more difficult. Our Bureau of Game Conservation spent over \$110,000, or two-fifths of its budget, for predator control during the fiscal year ending in June, 1946. Most of the animals taken were coyotes. State, federal, and private trappers kill over 5,000 of these carnivores in California each year. Stomach analysis shows that the coyote eats game and domestic stock. The quantity of these foods in the diet depends upon the locality, the season of the year, and the habits of the individual animal. Many of the domestic and game animals are taken as carrion. This is not true of the rodents and rabbits which comprise the bulk of the diet. Therefore the value of the coyote as a scavenger and ground-squirrel eradicator must be considered.

The method of control is significant. The gun is most selective but least efficient. Even the expert coyote trapper takes many gray foxes, badgers, and other animals in his trap line. Poison is probably least selective and most dangerous. Most of the desirable predators are slower to recover from a poison campaign than is the adaptable and rapid-breeding coyote. The value of the animals killed "by mistake"—fur bearers, mousers, and gopher catchers—must also be balanced against the damage done by this "arch predator."

What can I say in behalf of this outcast? It does much real (as well as alleged) damage to human economy, and I favor its control locally where competent study has actually established that it is materially interfering with agricultural interests. But since ranchers, cattlemen, sheepmen, and

hunters will clamor for its head, it is the particular job of the conservationist to prevent ill-advised and unnecessary killing. I have seen professional trappers operating in chaparral country far from farms or livestock; and I have seen them working without permission on private farm land planted to sugar beets. I strongly oppose such wanton killing of an animal which is a natural part of our fauna.

However, the coyote thrives in spite of all efforts to exterminate it, and in recent years has even followed man to new hunting grounds in eastern United States and in Alaska. It is worth noting, therefore, that any concern which we may have for the coyote is for the *individual animal*, and not for the *species*. I believe that the protection of species which are threatened is more deserving of the conservation's best efforts than is the protection of individual animals belonging to species which are doing quite well for themselves.

The ecologist, Paul L. Errington, has made some very significant contributions to the understanding of predation. Working with bobwhite, he was able to demonstrate that the number of birds present in the spring is determined by the suitability of the winter range. Each locality has its own "carrying capacity" for bobwhite, and no more than this number can survive the winter no matter how many birds are alive in the fall. Studies on muskrats lead to similar conclusions. The size and nature of the marshes determines the number of animals which can enter the breeding season. If the spring muskrat population is below the carrying capacity of the marshes, the animals are practically immune to predation. No matter how many predators are present, they find it unprofitable to hunt muskrats, and they turn to other foods. Conversely, if the population exceeds the carrying capacity, the excess individuals are driven from the tenable habitat into submarginal areas where they fall easy prey to minks, weasels, foxes, otters, hawks, and owls. If predators are absent, the muskrats kill each other, or wander off to die on highways, or to starve in open fields. Predation, then, eliminates only a doomed and vulnerable excess, and does not effect the number of breeding animals.

This principle seems not to apply to mountain-lion predation upon deer because the lion eats almost nothing but deer, and, although other factors are involved, serious deer outbreaks have often been associated with the elimination of lions by man. However, these facts are known to pertain to pheasant, grouse, and a number of other animals. It would seem that we may have here grounds for disclaiming the assertion that predators should be killed to save game species. On the other hand, if the carrying capacity principle applies to the ground squirrel, as it doubtless does in part at

least, then we must be cautious about calculating the value of the coyote as a ground-squirrel killer.

This discussion of predation leads us to the important conclusion that each case must be decided upon its own merits. Do I favor predator control? Control of what predator? Where? Under what circumstances? And by what means?

So much for predation. As a final question, how does wildlife conservation relate to the conservation of other resources?

The significant relationship between animals and the soil has not yet been fully investigated or appreciated. The most fertile soils provide animals not only with the greatest quantity of plant food, but also with the highest quality food. Correlations between soil type and the distribution of muskrat, prairie chicken, wild turkey, and bighorn sheep have been demonstrated. In Missouri the fox is nearly absent on one kind of soil and the raccoon on another. It has been shown that if other factors are equal, the cottontail rabbit and raccoon which inhabit areas where the soil is most fertile have the greatest population densities and also the largest body size. A. S. Leopold recently made a survey of the game birds of Mexico under the auspices of the Pan-American Union. He found that the most crucial factor in the destruction of Mexican game has not been poaching or inadequate hunting regulations or predation; it has been soil erosion.

The intimate and complex relationship between animals and their environment is the basis of the science of ecology. The environment cannot be modified without altering the fauna. Moderate changes in the wilderness, such as the clearing of underbrush for a ski hill, the pollution of a river by a mining operation, or seasonal grazing by sheep, may be expected to have profound effects upon the fauna, including the local extinction of some species.

Reductions in the size of wilderness areas also affect the animals out of proportion to the actual acreage lost, unless the initial area is larger than that of most of our parks, refuges, and wild areas. The mountain lion normally travels a fairly definite route which may cover 100 square miles and require a week or more to cover. Martens often travel fifteen miles in one night, and the wolverine hunts over vast areas. These wanderers cannot survive on postage stamp refuges, or in wilderness which is crisscrossed by highways and railroads.

Since the welfare of wildlife is dependent upon the size and condition of the environment, wildlife problems can seldom be regarded as distinct from basic conservation planning. Wildlife should always be one of the

factors considered when evaluating suggested alterations of the wilderness. To illustrate, let us consider the proposed Glacier View dam which, if constructed, would flood 21,500 acres along the west boundary of Glacier National Park. This area is the winter range of many animals inhabiting the park drainage of the north fork of the Flathead River. The Park Service estimates that the dam would exterminate 20 per cent of the mule deer and elk, 70 per cent of the white-tailed deer, 70 per cent of the beaver, and 80 to 90 per cent of the moose. Other factors must, of course, be weighed, but conservation now can save these herds; management after the dam is built would be almost certain to fail.

This approach might be called foresight conservation. The closing of the season on wolverine 22 years after the alarm was sounded is surely no more than conservation by hindsight.



Are Mules Necessary?

By DAVID R. BROWER

THE 1947 HIGH TRIP was over. The last mule string was in, and with a minimum of skittishness, mules were letting the last slingful of dunnage bags be dropped to the dust of the Pine Creek roadhead, to all but lose themselves among the slings, box and canvas kyacks, pack ropes, stoves and other kitchen paraphernalia, surplus food, fishing rods, trucks, cars, milling hoofs and boots. Somewhere from the midst of the thinning group someone would emerge, dressed half for the mountains and half for dinner in Bishop, to claim the last dunnage and to lash it to a fender, to a ski rack, or to stow it in a bulging trunk. Soon the last farewells would have been exchanged, Pete Garner and Ike Livermore would lead the last mules down canyon to the corral, the last car would crunch off in the gravel to disappear down around the turn, and the roadhead dust would settle.

Then the trip would be really over. The last of the one hundred sixty persons who had just spent from two to four weeks traveling the High Sierra wilderness trails through Sierra and Inyo national forests would be safely on their way home. Everyone would be accounted for, and the management could relax for the 300-mile drive home—with a prelude of nonwilderness steak in Bishop.

It was dusk as we headed north. A short time earlier the sun had set behind Mount Humphreys—in about the same way it had set a month before, when we started the trip. I guess we thought the thoughts most people think when an especially pleasant trip is over. There was no ordered procession of happy recollections, but just a vague feeling that something good had ended too soon.

We knew, without a doubt, that the mountains—the wilderness—had done something for us, something to us. Exactly what it had done I can't venture to say yet; perhaps the answer to that question will appear later. But another question had been in the minds of many of us throughout the trip—and for some years before the trip. What were we doing to the mountains? The trip was over, yes. But how completely over was it? When would the duff we had ground into dust at the roadhead be replenished? When would the boggy bits of meadow that served, in places, as trail for the mules, none of whom wanted to step in the other's fresh-churned mud—when would these green bits recover from the seventy-five sets of hoofs that had ground them into a wet black ooze? Had the mead-

ows provided more forage than they could afford? Had serving lines, stove and tea-fire and campfire sites, garbage pits, and boudoirs beaten too many gardens beyond recognition? Would hoof-cut waterbreaks on the steep stretches of trail be repaired before erosion set in? Had this same sort of wear and tear on the mountains, repeated year after year by large pack trips, caused an irreparable damage? If so, was the wear inordinate in reference to the number of people who had enjoyed the mountains that were worn because they had enjoyed them? Or, to end the forensic recapitulation with one gloriously ambiguous question, when and where should the mountains be used how and by whom?

That such a series of questions should ever be asked would probably astound John Muir and his contemporaries who, with him, sought to entice more and more men to the Sierra, to make it more accessible, in order that there would be a strong, well-informed group ever ready to protect the best of the Sierra from use that would mar its beauty and its wildness. Muir could hardly have anticipated the day when men—practical men at that—got together and agreed that we should stop building roads into California's high mountains, much less the day when they should begin to worry about traffic on the trails. Yet that day has come. And the Sierra Club's High Trip, being the largest single contribution to wilderness travel today, is the one which many men worry most about.

They worry in part about the large number of people—that has troubled them for years. They'll ask, How can you see the mountains for the people? Most likely, because most of the worriers are anglers, they'll fear that the thundering horde will clean out all the lake and streams, as did the fisherman Dick Leonard passed the time of day with while he was descending south from Glen Pass. "The Sierra Club's been through," the man said, pointing his rod in the general direction of Bullfrog Lake, "and they've cleaned it out." Leonard explained that he was leading the Sierra Club High Trip, was looking for the next campsite, that the members hadn't even seen Bullfrog yet, not to mention fished in it. He could have added later that High Trip fishermen that year were no better than usual, and that the trip as a whole averaged one half trout per man day—hardly enough to clean out any lake in a day's time.

Observers who are more cautious than the fisherman in their conclusions are less concerned about trout—which can be planted in proportion to the number of effective fishermen—than they are about the meadows, critical as the grasslands are in the ecology of the High Sierra traveler. They point out that those meadows along the main trails that are within a day's travel from roadheads are called upon for more grass than they can grow,

either from trip to trip or from year to year. They compare the deterioration of overgrazed or overtrampled meadows with the luxuriance of High Sierra gardens that have never felt a mule's tooth or hoof. They recall that knapsackers eat no grass, that the charges of burro chasers eat little more, that the stock used by spot campers enjoy no more than a snack from an overburdened meadow before the animals are turned around and headed back to the hay of their roadhead corral. Some of the observers see no harm in a series of huts or camps an easy day's walk apart, such as those in the Yosemite High Sierra, supplied by stock that round-trip it in a day from road to camp to road. Others have no objection to stock as long as the strings are few and their visits to a given meadow are infrequent. Still others like neither to see mules in meadows nor to be reminded that mules have been along their trail. Finally, there has been a cry for a ceiling on a given trip's mule count and man count.

Where, then, does the big trip, inaugurated by the Sierra Club in 1901 and carried on today, in approximate ascending order of size by the Contra Costa Hills Club, the California Alpine Club, the Trail Riders of the Wilderness, and the Sierra Club—where does the big traveling trip stand? Should it go on, or should it just go?

I am not sure that a person who has participated in the management of six big trips, with a seventh coming up, can be considered disinterested enough to attempt to answer objectively such multi-ramified questions. True, I did learn how the other half lives by knapsacking quite a bit, but that was a few years back. The problem trees of High Trip details are very clearly framing, if not obscuring, my vista of the mountain-use forest. Nevertheless, these various questions are being asked so insistently by men in such high places, and the answering of them can affect so many people, that it seems important that a person who has been in the midst of management problems of a big trip, and at the same time has been able to see what the trip has meant to those who have taken it, should at least submit his conclusions for whatever they are worth, and then perhaps abstain from voting.

Herewith, then, in behalf of those who since 1901 have enjoyed High Trips, as well as for those who in years to come should perhaps be permitted similar enjoyment, there are presented forty-three exhibits. The first forty-two High Trips, from 1901 to 1946, almost all of them duly recorded in the pages of the *Sierra Club Bulletin*. The forty-third exhibit, the 1947 trip, is described in some detail. Perhaps a few of the eight questions raised will find their answers in the description. That, at least, is my intention. . . .

Agnew Meadows—rather more forest than meadow—served as the High Trip rendezvous point, and from midmorning until after dark the members assembled at the end of one of the poorest roads in the Sierra—a road almost too narrow to permit the driver of a modern low-slung car to maneuver enough to avoid the alarming crunch of oil pan against rock.

The packstock had already been trucked in from Lone Pine and was now happily dispersed in the meadows, except for those being shod or otherwise worked over in the corral improvised with rope in a small, out-of-the-way opening in the lodgepole forest. There were some seventy-five head in all, watched over by Ike Livermore and his contingent, as pleasant a group as ever gave a string of mules a bad time or a good time, depending upon the need of the moment. Pete Garner, whose ancestors were in this country when the *Mayflower* arrived, was second in command to Ike, and a veteran packer who handled with equal ease and serenity the heaviest loads—the stoves—and the mules that carried them. Bud Steele, another veteran, was one of the men—if you would believe him—who helped the devil pack in and set up the Devils Postpile. If he didn't look old enough for that role, at least he was talented enough. Tommy Jefferson, a full-blooded Mono, had a tireless smile that let you know you were welcome to the land of his fathers. During the day he charmed one of the strings of mules that carried commissary impedimenta; and in the evening, we knew from last year, he could charm both a guitar and those who listened to his repertoire of songs. Among the others who handled a horse and a string of five mules per man were old-time packers from Owens Valley and college students who wanted to learn something about livestock in its least prosaic environment. Ed Thistlethwaite, Owens Valley artist with a broad accent that was anything but indigenous, was our night hawk. It was to be his job, when the camp should be heavy with sleep on a moving day—and that is earlier than would sound reasonable in print—to get up and watch the dawn in the high and relatively inaccessible pasture lands to which the stock had been pushed, then to round them up and bring them down to work. A lad from Yale watched over the saddle horses, a few of which had been brought along for persons who either already knew they weren't in condition for a hard day on the trail or who would find out before the day ended. Ike Livermore thought that his wife, who came along to take care of the man who was taking care of the packing operation, should have some title; and so Dina Livermore was the Assistant Saddle Horse Boy.

The commissary group was less glamorous, but hardly less important. Ted Grubb, the assistant leader, and now chairman of the San Francisco

Bay Chapter, had been on many High Trips, and was so industrious, we knew, that he would several times have to be driven out of camp to relax and look at the mountains. He was to be last man out of camp, and principal landscape architect. Jim Harkins, chef, and member-at-large of the club membership committee, was the only man in High Trip history to combine the talents that would enable him to cook breakfast, lead a party up Mount Ritter, and return fast enough and fresh enough to cook dinner. His name was on more Sierra peaks than he could count without sitting down with a map for a long time. Charlotte Mauk, co-cook and a director of the club, was planner-in-chief of menus, and had spent many a winter and spring evening computing the relative amounts of each item that should be on hand in order to turn the daily quarter ton of food into three well-balanced meals—and she was versatile enough as well to know how those meals could best be balanced on a mule and which course should be on which mule in order to reach the next camp in time to be ready for dinner. These were the veteran veterans; but several others—Bill Blair, Bob Breckenfeld, Toni Bristow, Eleonore Ginno, Pat Goldsworthy, Jack Heyneman, Howard Parker, Helen Smith, Nance Wale, Joe Wampler—had been on High Trips before and well knew the traditions of the trip; the rest of the group, new to the game, were Clark Aaronson, Anne Brower, Joan Clark, Jane Goldsworthy, and Stephen Jory. Their collective effort was in the main a labor of love—a love for the type of trip and a high regard for the mountains it took them into. The leader's main job was to see that the traditions were kept alive and the mechanism kept rolling that had been so extraordinarily well built up through the decades by William E. Colby, Francis Tappaan, and Dick Leonard. The machine had merely to be adapted to the situation and the terrain.

All but inseparable from commissary proper were those old-time high trippers who had paid to go on the trip year after year, for whom no really good designation has yet been coined. Take Bob Lipman, for example. Years ago he himself was in commissary and never has forgotten how welcome was the helping hand. Always one of the first into camp, he was also one of the first to grab an ax and start splitting wood for the stoves. Cedric Wright, who has probably been on more High Trips than anyone, always manages to arrive just ahead of the first raindrop if there is a tarpaulin to be pitched, and he is as versatile a tarp hanger—and no two can ever be hung the same way—as he is a photographer. Then there are the main body of high trippers, the guests who are not guests because, although they are the people for whom the trip is run, still it is their trip, and they all lend a hand.

The important thing about the guests (shall we call them that for the sake of brevity, and have done with it?) is their diversity. There is some significance in the variety of physical ability, taste, and temperament that this trip successfully brings together for enjoyment of the Sierra. In 1947 we had no octogenarians along, but some have made the trip in the past; we had to be satisfied with an age range that included several in their sixties and one who had just hit ten—David Armstrong. Grandparents to grandchildren, professional people and wage slaves, teachers and the taught or the learning—these were the main categories. They had in common, aside from a liking for mountains, a certain affluence, for the trip did cost nearly five dollars a day for three meals, for half a mule per man to transport everything, and for a chance to sleep on pine needles (a sad commentary on what inflation has done to the original cost of less than a dollar a day!). But here they were happily together, exploring and enjoying mountains in their own individual way. For those who took to the peaks there were others who took to the streams or the high lake basins or the meadows or the sunny granite benches. Most of the younger members had the physical condition to take off on their own cross-country knapsack trips, and with a little more experience could probably do this on their own in future years, quite independent of the High Trip. Others, not necessarily older, might be forever incapable of penetrating wild country on their own: perhaps they preferred their solitude diluted a little; or they might have neither the physique to forsake the mule and shoulder all their own loads, nor the knack of getting along with mule or burro should they not wish to forsake them; they might have an equal horror of depending either upon their own cooking or upon their ability to tell one mountain from another and keep on a trail. I myself, having in 1939 conquered my fear of so large a crowd, learned that same year that it was pleasant indeed to travel with a group the variety of which could match the variety of the mountains. It strikes me today as reasonable and true that given both varieties, one is less apt to be bored with either.

Much more should be said about the people, but let's leave most of it for next year—except for one more word about ten-year-old David Armstrong. Ordinarily a High Trip can't accommodate young children, but Dave was strictly the outdoorsman, the friend of all (but not spoiled by them) and the envy, in his rugged independence, of many. I'd say that it is most desirable to have a youngster along on a trip, so long as there is enough family along to get him washed behind his ears once every week or so. For through his eyes you rekindle your interest in the things that tend to become commonplace; watch him, and you awake each morning

to a strange and wonderful world of streams and rocks and of living things that have no names and that you have to find out all about before the day gets too old—perhaps even before breakfast. I'd watch little Dave, a tiny figure in blue jeans and a broad straw hat, far out in a broad green meadow with the shine of glacier-polished granite above it, now running along the stream, now bending over with his legs apart and hands on his knees in deep study—of a frog, no doubt—then off again to look for a log crossing, with no one near him and no helping hand to be tolerated—the Minarets that already towered above him gaining in stature a thousand feet for every foot he had not yet grown. And I'd find myself much more philosophical about the problem of the missing climbing ropes that someone at my right elbow had broken into my reverie with.

Yes, we were under the Minarets now, camped in a scattered grove of graceful hemlocks above Lake Ediza, an easy day from Agnew, camped up on a bench closer to the peaks—and as Ike Livermore looked at it, nearer the rocks and farther from grass—than a High Trip had camped before. The standing operating procedure for High Trips had governed the setting up of camp, and its consideration of the terrain bears a little looking into. First we considered the mules. Could they reach the site in an easy day and make a back-tracking round trip next day for the balance of the supplies? Was feed for them near enough? Where in the general area were there enough bedsites for the five categories of sleepers, men, women, married, commissary, packers (not in order of importance; to this I refuse to commit myself), and was there room enough between sleepers for the mules to run to and fro when they tired of eating and sought amusement? Then commissary. Was there water, a level spot for the stoves, trees about it for tarps if needed, disintegrated granite or duff for main lines of traffic that would otherwise wear down the meadows, shade for the perishable foods and a pool or snowbank for the frailest perishables, near-by bedsites for the early-rising commissary people, diggable ground for fire and garbage pits and—preferably not too awfully far away—for the sanitary facilities? Were there two or three dead lodgepoles handy for Joe Wampler and his volunteers to fell and split? Of no mean importance, could the mules reach this site to unload and was there room for the unloading of several strings at once? Where could the women's mules unload, and the men's? And not too near the exact center of women's camp, could packers set up their rope corral in which to feed grain and saddle up? My principal problem was that of sprinting along the trail fast enough to reach camp and make all the decisions before those who had been breathing hot on my neck wanted the answers. Then I'd collapse

and worry about details—and catch glimpses of Dave out there in the meadow.

In the end it is always the mules who determine the itinerary of a High Trip. Once the optimum requirements of a campsite have been determined, it is then necessary only to find a series of optimum campsites that are so spaced as to allow the strings to move dunnage and a few meals' food to them on one day, and to move the balance of supplies to them on the next one or two days, with an occasional day's rest for mules and packers. If the campsites are the most scenic in the area, that's fortunate. If the most scenic of the sites are those where the trip must lay over longest while the mules shuttle, that's amazing. And if one of those scenic spots should be hit at the same time by the High Trip and by any other large party, that's impossible—and is now precluded in pre-trip discussions.

As usual, the mules determined the 1947 itinerary, which connected a series of place names meaningful to those who know the places and meaningless to those who either haven't been to them or don't distinguish one name from another place or vice versa. From Lake Ediza we moved to Reds Meadow and its unavoidable road, then hurried on in a long, warm, dry day to Purple Lake for a layover. A spot near Lake of the Lone Indian—but not nearly so near as advertised—came next, followed by a long, cool, refreshing day that saw us over Silver Pass and part way up Mono Creek, opposite Second Recess. Mono Pass served as the trade route for two-weekers, who went out and came in via the Little Lakes Valley road. For the mules who made the round trip over the pass from Second Recess, the sight of the meadow expanses of upper Mono Creek proved too much. At their first unfettered opportunity they returned to their greener pastures, not to be rounded up in time the next moving day for dinner to be punctual at Bear Creek camp. For some ninety of the high trippers, that wait for dinner was especially long, for they allowed themselves to be talked into a cross-country deviation from the John Muir Trail that took them from Second Recess camp on a beeline (if the ups and downs be disregarded) right through First Recess to the Bear Creek site. The Hilgard Branch of Bear Creek, close under Lake Italy and untouched by previous High Trips, came next. Then it was over Selden Pass to Sally Keyes Lake, where Ollo Baldauf discovered two mountaineering rattlesnakes far beyond their recorded altitudinal range. One more move remained before we should leave the mountains, and this was to be Contour Day.

We were camped, on Sally Keyes Lake, at an elevation of 10,100 feet. Our next camp, in French Canyon, was to be at the same elevation. The trail was most thoughtlessly laid out to drop into a hole—the Piute Creek

Canyon—about 3,000 feet, and then climb back out. What, then, could be more logical, for persons who didn't fancy so much drop and climb, than that they should follow the 10,100-foot contour to the next camp with as few compromises as possible? This, in gist, was the proposal I made at campfire, quickly following it with additional remarks that were indeed more logical. The trail was better for those who had doubts of their cross-country technique, and was a beautiful if arduous trip for those who hadn't seen it already. The "contour" route would involve only slightly less ascending and descending, and although it would be some six miles shorter and would afford splendid vistas that would be lost to the canyon plodders, those six miles would cost in difficulty of steps every bit of what they saved in number. Routes that seemed good on the map were actually seldom what they seemed. We ended up in four major groups. The trail travelers took off early in groups of two or three at their own good pace. Dr. Stewart Kimball led a second group of slightly-less-than-trail travelers, who explored a trail that was still shown on the map, but rarely appeared on the ground. Lewis Clark took a small party back over Selden Pass, up under Seven Gables to the headwaters of the East Fork of Bear Creek, and crossed a knapsack pass into the French Canyon watershed. The route that struck my fancy, and apparently that of nineteen others, traded the 3,000-foot drop for three knapsack passes, only one of which I had ever previously seen both sides of. One I had never before seen either side of turned out to be badly mapped: a broad, almost-gentle, nivated slope that showed on the map became a chute that afforded a bit of rock scrambling. But the entire party, right on down to Dave Armstrong, were game and made the whole trip well. Dave did, it should be recorded, consent to be expedited for the last mile, trading tired horses for fresh ones every few hundred yards and arriving in camp fully as pert as his pick-a-back steeds.

Already we were in our last camp. For days on end—but never enough—we had enjoyed the High Sierra wilderness just as the members of previous High Trips had. There were close-ups of sand and granite, grass and wildflowers, distant vistas of peaks and, at long last, of clouds; there were strange and familiar friendly sounds and smells, by day and by night; there were stops, long and short, to talk about things that were important and things that needn't be; there was a growing sense of being fully alive, fit, vital, of being a collection of cells that were at last acting as one surging, directed, homogeneous entity—we were awake, fully awake to our world. And what was a blister or two or a pine needle in the soup?

It would be overenthusiastic to maintain that the vitality we found in

the wilderness could be found nowhere else. A skier's spirits may soar when he descends a crowded slope, a composer's when he stumbles upon and tries to hold a series of chords whose relation is all too evanescent, an editor's when from nowhere he picks up the word his author just missed—to each his own heady drink, one man's stimulus no doubt being the other man's sedative. Here in the Sierra wildland, men found or renewed vitality that didn't come to them in any other context, whether in 1947 or in 1901.

Then came the first final campfire for some, the final final campfire, perhaps, for others. The auld-lang-syne feeling ran high—who would object?—and the embers burned themselves out.

That last Saturday morning Ted Grubb, chief landscaper, laid the embers to rest, just as they had been laid to rest in the other camps. Cans were smashed—cans that preceded us to the camp as well as our own. Papers, cans, bottles, and those indestructible embers were gathered by willing hands and tossed into the garbage pit. Old cartons were consigned to the top and burned, a little lime was sprinkled on top to complete the deodorizing so that later fur-bearing passers-by would not undisturb our disposals. Distinterred rocks, sand, soil, and the carefully saved sod were in turn placed over the pit. The leftover firewood from split up trees was piled where it could serve later travelers who would not be equipped to use full-sized dead trees. The most prominent tracks—they were almost trails—around commissary were given a scattering of needles. The stoves and pots and the small surplus of food were loaded on the mules to follow the outgoing high trippers and dunnage strings over Pine Creek Pass. Then French Canyon was quiet again. For a few days there it hadn't been what you could call pure wilderness. After all, pure wilderness can't exist so long as there's so much as a yodel in the air, not to mention an early-morning wake-up call and several dozen discordant, off-key echoes. Pure, unadulterated wilderness could hardly survive human contamination of any sort, and we must arrive at some criteria of use that will allow men who feel the need for inspiration—to overwork the word—to take much of it as they need from the wilderness with as little damage as possible to its source.

The criterion of use realized in the High Trip turns out to be this, that the men who come, and the things they need, come by trail and leave the way they came. . . .

Maybe a few of the answers to our questions—questions that were intended to be complicated and searching—are implicit in these notes on a High Trip. Perhaps more of the answers are missing. I would not presume

that they aren't. But a few simple conclusions are indicated: Although some damage to the mountains occurred, it would seem to be less per man-day of enjoyment than it is in other trips. Compared to other pack trips, the High Trip uses far fewer head of stock per man, and these are grazed for the most part in meadows not ordinarily accessible to smaller parties, that cannot easily detour too far from their planned route. Compared to unorganized trips of any kind, the High Trip leaves the mountains cleaner; signs of human activity and metabolism are so concentrated that they may be properly disposed of instead of being scattered from sagebrush to timberline. The comparison with other types of organized wilderness trips is difficult to make. There would seem to be a reasonably fair measure of the relative need for the variety in the Sierra Club list of outings—the Saddle Trip, the Base Camp, the Burro and Knapsack trips, and the High Trip. Each of these has been conducted over a long enough period of years to demonstrate how many persons it will attract from what groups. Each fills a need and fulfills a demand. The termination of any one of them would force people who like it best into the other trips, and some of them might well be happy about the change; substitutes, however, are customarily accepted only with reluctance.

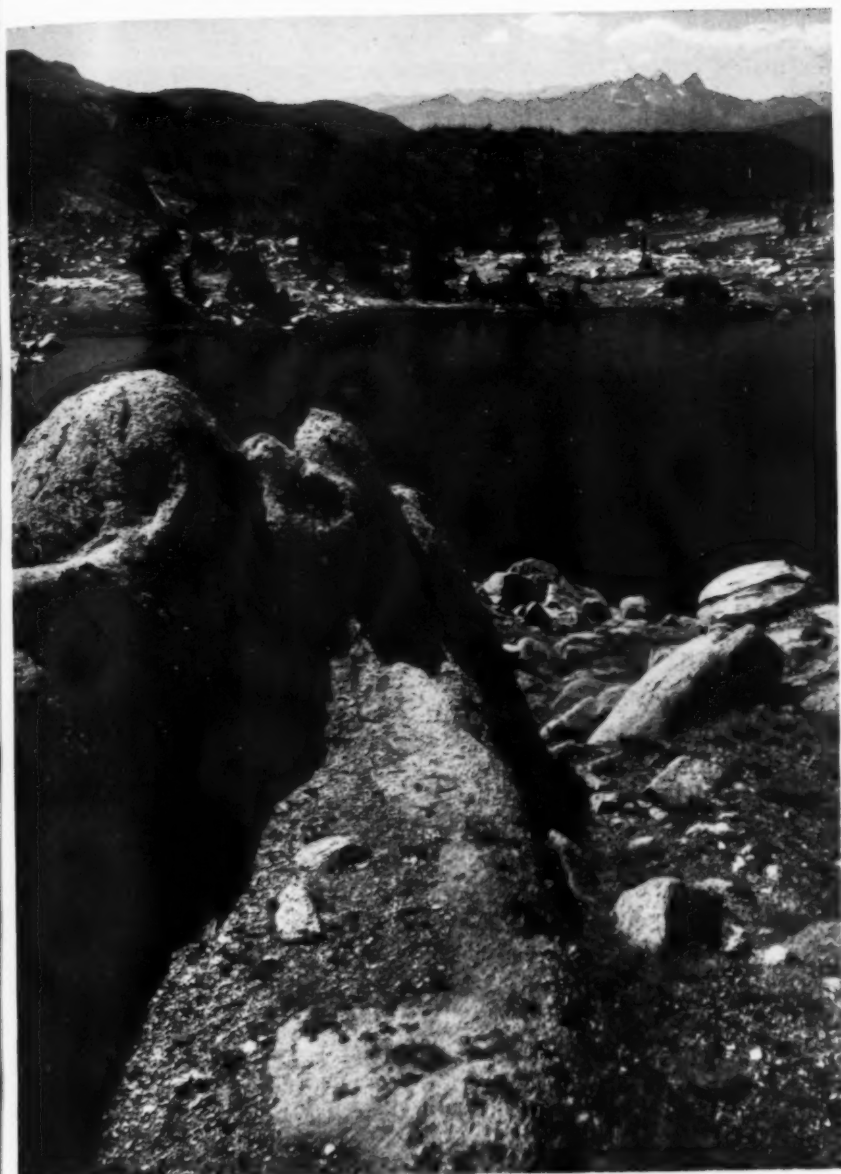
So it would seem that the big traveling trips through the wilderness, such as initiated by the Sierra Club in that first Annual Outing, should be continued, by whatever organizations may be qualified to conduct them. The argument that John Muir presented remains essentially valid. If we want mountain wilderness—the spacious scenic wilderness that means something—we must make it known to the men who, knowing it, will protect it. Those who like best the most Spartan of wilderness trips—cross-country backpacking—must make haste slowly in any attempts to impose such trips upon others, or there may be too few men in the wilderness to protect it. On the other hand, an overemphasis on spot camps, which can be successfully conducted within a few hundred yards of chalet development, may well leave us only those protectors of mountains who feel that a Yosemite Valley is wild enough. Doubtless there are few who would not wish to maintain the present, nearly ideal zoning of mountain recreational areas, which now properly or improperly accommodate all manner of tastes, whether in the clubs and motor courts at Tahoe, in the hotels, campgrounds, and High Sierra Camps in Yosemite and Sequoia, in the packers' and anglers' spot camps one day in from roadheads on the east and west slopes of the Sierra, or in the wide undeveloped spaces of the High Sierra Wilderness Area and the back country of Yosemite, Kings Canyon, and Sequoia national parks. All but the last of these tastes—the

taste for wilderness—can be expected to fare well without our being concerned. To hold the wilderness, however, we need defenders of all ages who have at some time in their lives traveled the wilderness trails. We need so many of them that we must, as the pressure for all types of mountain recreation grows, get as many of these defenders out on those trails as we can with the least possible damage per man per visit.

Accomplish this and we can be certain, when the embers of another final campfire in French Canyon burn themselves out, that they have not gone out forever. We shall know that another year will bring new faces into the campfire circle. Whether ours are there or not is not of great matter. But there must be faces, there must be firewood to be gathered, and all around the trees that flickeringly hold the night back from the campfire there must be wilderness.

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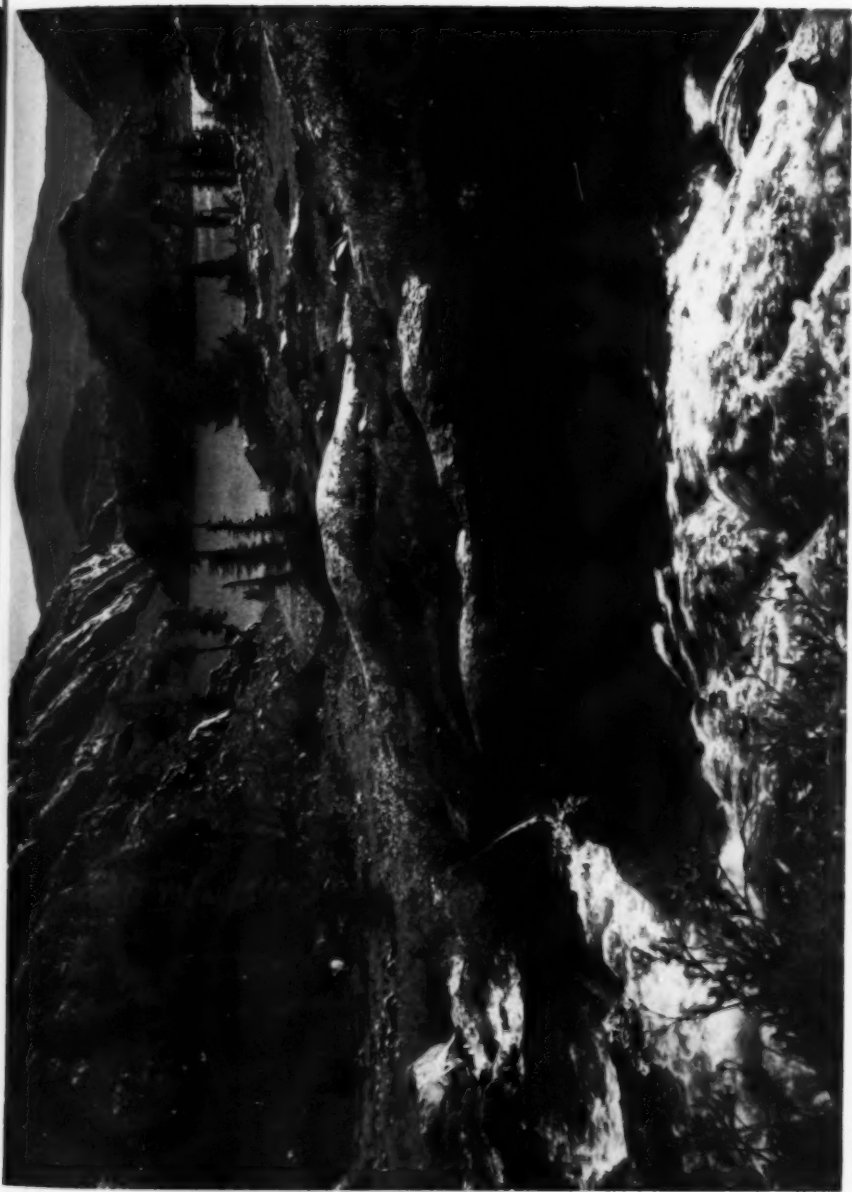


NEAR SILVER PASS

The Sierra in Summer . . .

Photographs by William Hail





LAKE EDIZA



DEVILS POSTPILE



SUN PITS,



SUN PITS, RITTER RANGE



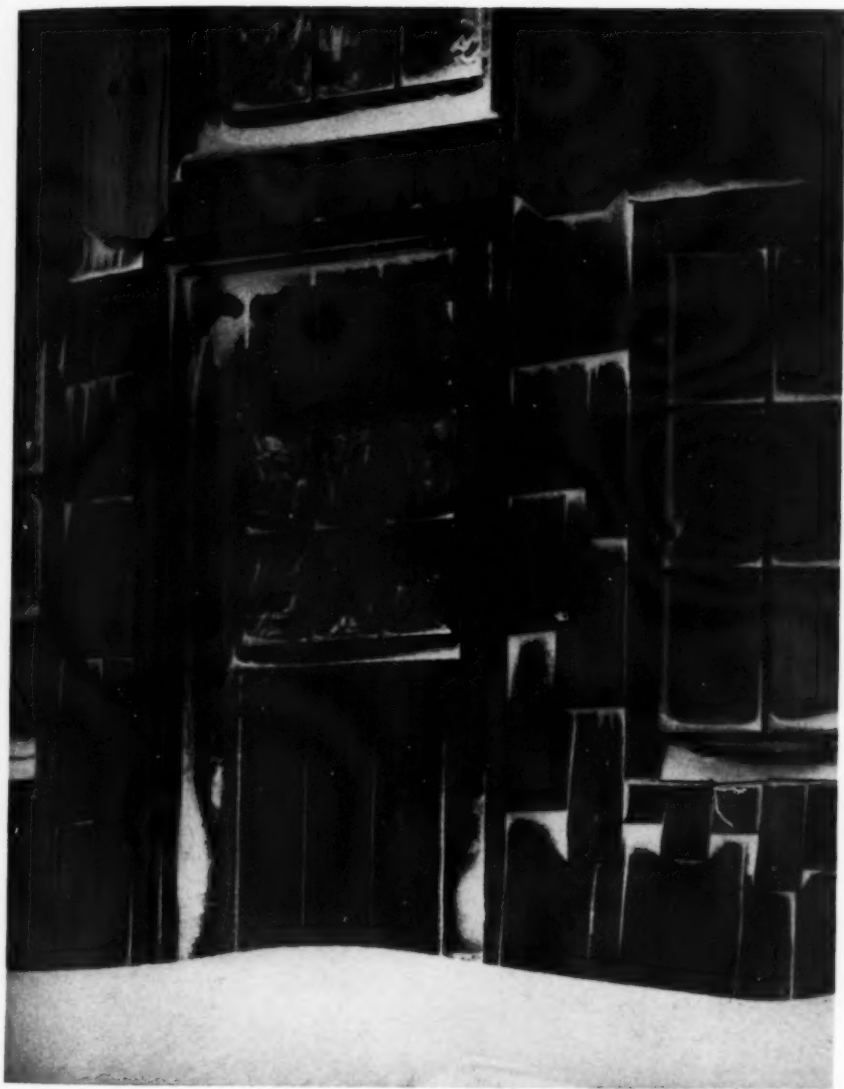


NEAR PURPLE LAKE



IN THE ALABAMA HILLS, OWENS VALLEY

At CLA



AT CLAIR TAPPAAN LODGE

... and in Winter

Photographs by Haven Jorgensen



New L



NEW LOOK



STREET CLUB TOWN



SIGNAL HILL CORNICE AND CASTLE PEAK





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Frostbite: Its Physiology and Treatment

By H. STEWART KIMBALL, M.D.

INJURIES DUE to exposure to low temperatures, whether described as "frostbite," "freezing," "trench foot," "immersion foot," or "high altitude frostbite," are basically similar regardless of type of exposure or whether actual freezing of the tissue occurs. The only difference is the factor of time; high altitude frostbite may occur in a matter of seconds to the unprotected hand, while trench foot takes days to develop. The mechanism of this type of injury and the newest thought on treatment are discussed here for mountaineers and skiers. No original contribution is claimed; this is only a review of some of the latest articles.

The initial reaction following exposure of a limb to temperatures near or below freezing is usually blanching. With continued exposure this is regularly followed by an intense pink color which, with further cooling, reverts to a cadaverous blanching. This white color persists for some time after the cessation of cooling, depending on length and severity of exposure. The next phase, during warming or thawing, is invariably characterized by an intense red, a rapid swelling and a rise in temperature of the limb. Blisters are usually present; they grow rapidly in size and may burst within 24 to 48 hours. The fluid is straw-colored or bloody; if the blister persists for more than 24 hours, it usually contains a gelatinous mass. The skin, especially in the areas of direct exposure, loses all sensation to pin prick, heat, and cold. Within 3 to 10 days, depending on severity of exposure and individual predisposition, dry black areas may appear, followed by dry gangrene.

Experiments have been performed to study the blood circulation in limbs injured by cooling. The dye, fluorescein, was injected into the blood and the limb was examined under ultraviolet light. The dye emits a fluorescence, the intensity depending on its concentration. It was found that there was no fluorescence (fluorescein-blood) during the initial cooling (the blanching reaction) and for about 1 hour afterward. Slowly thereafter the dye started to reappear in the previously cooled area and within 4 hours there was an increased fluorescence, as compared to the normal skin, indicating an increased blood flow and increase in the permeability of the capillaries. Even when the limb was squeezed to render it bloodless, the fluorescence persisted, indicating that the dye had escaped out of the blood vessels into the tissues. There was marked swelling due to this loss of fluid into the tissues, and the limb was red. In 48 to 144

hours, however, the injured area was again completely nonfluorescent, indicating that there had been complete stopping of the blood flow. This stoppage leads to gangrene.

If the tissues exposed to cold are observed with a capillary microscope, it is seen that in the course of the phase of increased blood flow the red cells start to silt up the capillaries, forming a sludge which blocks them. This in turn stops the blood flow and produces gangrene. This silting is due to the fluid's escaping through the damaged capillaries into the tissues and leaving the red cells behind.

Even though the process may not go to complete capillary blockage and gangrene, the fluid which escapes into the tissues causes changes characteristic of frostbite. The skin becomes scarred and thin; the protective layer of fat under the skin disappears, its lack probably having much to do with the long-continued sensitivity to cold in the damaged area. The nerves show changes, which probably explains the persistent pain sometimes felt.

Unquestionably, the easiest way to treat frostbite is to prevent it. Predisposing conditions must be avoided, for example, prolonged standing or constriction of a limb with tight clothing, shoes, and gloves. Those persons who suffer from chronic illnesses such as heart trouble, diabetes, anemia, undernutrition, and poor circulation (obliterative endarteritis, arteriolar sclerosis) must be extremely careful. Adequate clothing and covering must be provided, both warm, windproof, and loose enough to prevent constriction. Care must be taken to see that bare fingers do not touch such good conductors of heat as metal ski edges, bindings, or instruments. Wet clothing must be replaced with dry, and whenever there is blanching of skin or numbness, immediate steps must be taken to dry, warm, and return the area to normal color. Keeping the body warm helps maintain the circulation and warmth of the extremities.

In event of frostbite the injured part is to be warmed gradually; avoid rapid heating and rubbing. It has been found experimentally that warming to 110° F. or cooling by an icebag increases the severity of the injury. Room temperature seems to be best.

The victim's general circulation must be maintained and, if shock is present, he must be treated with warmth and the judicious use of stimulants. The injured part should be put at rest and protected from further damage, both thermal and mechanical, by covering with sterile (or at least clean) dressings, elevating it if possible, and maintaining it at room temperatures so that it may regain body temperature by itself. If at all possible the patient should receive specialized medical care within the

first 24 hours. It has been found that if the blocking of the capillaries is prevented by use of blood anticoagulants, gangrene will often be averted. The drug, heparin, has been used to reduce the clotting power of the blood and this in turn prevents the clots in the capillaries, insuring adequate blood supply to the injured tissues. (I know of no work using the other anticoagulant, dicumarol, but can see no reason for not using it after the initial use of heparin.) Swelling and loss of plasma from the blood appear to be the same, and the red cells are left stranded in the capillaries; but they cannot stick together to form clots if heparin is present in the bloodstream. Frozen extremities which would have ordinarily been lost through gangrene have thus been saved. This type of treatment necessitates hospitalization, so that the drug can be given correctly and the clotting power of the blood adequately controlled.

Although gangrene has been prevented by the use of heparin, the other end results of frostbite short of gangrene—scarring, thinning of the skin, loss of sensation—were unchanged.

Finally, if gangrene does develop, it should be treated conservatively, inasmuch as the resultant loss of tissue is often much less than expected. A line of demarcation will appear between the dead and living tissue, and the dead tissue will eventually separate by itself.

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Babes in Sierra-Land

By DANIEL H. CONDIT

HOW CAN ONE engineer a High Sierra trip for a family with small children; or indeed, is such a safari possible? There are doubtless many travelers of the high trails who desire to acquaint their children with the beauty and wonder of the mountains, but who are in doubt about the age at which such an undertaking becomes reasonable and who do not know what techniques and special supplies are required. We, with the co-operation of some of our friends, have taken children aged two years or older on full-scale pack trips for five consecutive summers. In view of the uniform success of these trips and the many inquiries received from other parents, it seems worth while to describe these experiences.

Let us begin by recognizing that to take one or more small children into an area where the party may be twenty or thirty miles from the nearest road, at elevations ranging from 9,000 to 12,000 feet, in a region where heavy thundershowers and occasional prolonged rainy spells may be encountered—is a project not lightly undertaken. Certainly no young couple without previous mountaineering experience should be encouraged to strike out on their own with small children in tow. Many such families might return with enthusiasm for another trip, but too many others would certainly be disillusioned. Those of us who have spent many vacations on the trail forget that we have built up a tremendous supply of physical and mental know-how insulation against the rigors of the wilds. To the old hand, getting soaked by a thundershower is an incident which may, at least in retrospect, be considered humorous; but to a novice it is more nearly a serious emergency. An inexperienced couple would do well to spend one or two summers camping without their children or, as an alternative, go out with more experienced friends. My wife had never camped out prior to our marriage so our first trip was limited to a base camp one mile off the road. By the next summer we were ready for two short backpack trips and the third summer found us making a full-dress seventy-mile backpack trip.

Let us at this point define our field of discussion. First of all, we are concerned with a pack trip. The problems attendant upon taking the kids to a municipal or auto camp are not pertinent, weighty as they may be. Secondly, it is to be a trip in which only one or two families are concerned. Finally, let us rule out the deluxe pack trips with one or more professional packers to make camp and care for the stock and humans.

This narrows the field to (a) the base-camp trip in which a packer is employed to transport the party to some suitable site where the family is on its own until the prearranged pickup is made, and (b) the personally handled pack trip in which dad and mother wrangle the stock, make camp, cook meals, etc.—mostly etc. All our experience on the latter type of trip has been with burros which we consider ideal because of their size, speed, temperament, and ease of care. However, gentle mules or pack horses should certainly be quite satisfactory for those experienced in handling them.

One more factor should be mentioned before getting down to details. Most children will readily adapt themselves to the simplified and somewhat rugged life. In fact the average mother finds the veneer of civilization on her small boy remarkably thin. There are some children, however, who are nervous or sensitive to discomfort, and to take them into the high mountains would be a disservice to the whole family.

Assuming a reasonable background of experience on the part of the parents, the following points must be considered when children are to be included in the party:

- (1) Adequate shelter must be provided.
- (2) Suitable food will be necessary.
- (3) The child must be transported in a satisfactory manner.
- (4) These items must be handled so that the child will feel secure.

SHELTER

There is a wide latitude in the type of shelter which can be provided. Our own preference has been to sleep out under the stars except when the threat of rain requires use of a tent. Prior to 1946 we got along handily with a water-repellent home-sewn job, but the rains of that summer coupled with the increasing size of our youngster brought us too near the borderline and led to the purchase of an army mountain tent and two 7 x 11 waterproof nylon tarps. Except in a violent storm we expect to use a tarp lean-to and reserve the tent for the children in the party. It has been our experience that the ability to separate the tent from its floor is of great help in making and maintaining beds. Two 108-inch zippers are used for this purpose.

The question of sleeping bags is also of prime importance. Misled by the "steam-heated" sleeping habits of our boy Philip, we provided only folded and pinned blankets for him the first year. We were disillusioned the first night out, and he slept with us for the rest of the trip. He was then two years old. A small home-made bag of wool batting proved satis-

factory for several years and he has now graduated to a regular down bag. The following combination, from the ground up, has proved very satisfactory; ground cloth, woolen army blanket, sleeping bag with a sheet blanket liner, other half of woolen blanket folded over all. Sewing the folded sheet-blanket across the bottom and up the side has been helpful.

With respect to clothing there is again great latitude. Regular summer underwear, shirt, jeans or overalls, and sweater are suitable. A water-repellent jacket with hood for rainy weather and a wide-brimmed hat for sunny weather have proved of great value.

Miscellaneous items such as sunburn lotion, mosquito netting and repellent hardly need be mentioned.

FOOD

Perhaps the medical profession will overrule us, but we have taken the position that a somewhat decreased vitamin intake for a two-week period will injure neither children nor adults. The whole family soaks up fresh fruits and vegetables before and after the trip. Moreover plenty of canned or powdered milk can be taken, along with dried or fresh eggs, cheese, butter, lemons, and onions. Several satisfactory food lists have been published in past issues of the *Bulletin*, so none is included here. Copies of our lists will gladly be provided to any who may be interested. One stunt that has helped us control the list, which tends to expand from year to year, has been to record the weights of all items taken and of all remainders brought home. The previous year's list is then followed in making up the food for the next trip and serves as a control on averages and shortages.

Many mothers will be concerned whether preschool children can be expected to eat the same fare as adults. Being somewhat in doubt ourselves, we took along a goodly supply of canned baby food when Philip was two. Very little of it was used, but he did drink lots of canned milk. Some of our friends have been very successful with chocolate made from powdered milk.

There are a lot of stunts which help in keeping a child well fed. We often laugh when we recall the sight of little Carol Annis bouncing along on my back, placidly munching dry cereal from a little bag pinned to her coat.

TRANSPORTATION

We have found a gentle saddle burro eminently satisfactory for transporting children. At the age of three our boy required some attention and entertainment, particularly on his first day in the saddle. After he became

accustomed to riding he was easier to take care of on the trail than in camp. He spent many happy hours holding a few flowers or a pine cone and singing to himself. Five and six hours in the saddle (with a nap at noon) bothered him not at all. In retrospect, it seems quite possible that he could have ridden an animal even at the age of two. However, that first summer we rigged up a solid-bottom car seat with a foot rest and lashed it to a pack frame. The boy rode on my back, getting a fine view of where we had been. Usually he was ready to ride for longer periods than I was willing to carry his thirty-pound weight. In 1946 we ganged up with Chuck and Audrey Apple and John and Harriette Annis for a trip from North Lake into Evolution Basin. The Annises' three-year-old girl rode on the car-seat pack-frame rig while our boy rode a burro. Riding double on the burro was tried several times but the saddle was too crowded for comfort. That same year two other couples made the Cedar Grove-Bubbs Creek-Glen Pass-Paradise Valley circuit. They took two three-year-old boys, who rode in home-made packsacks facing forward in a sort of pick-a-back position.

That summer was marked by much rain. It is worth noting that all four children got along beautifully. They sat under overhanging rocks and tarps when their elders insisted, played in the wet sand, steamed out by the campfire, and rode their respective beasts of burden without complaining, rain or shine. While their parents hastily adjusted the tent ropes or furiously grubbed out drainage ditches, they admired the deluge, giggled at the freshet that ran right under the campfire, and welcomed the flashes of lightning and the roars of thunder. Not being called in out of the rain by an anxious mother was, after all, quite an event in itself.

For a change of pace, we made a base camp in Dusy Basin in 1947. We were packed in from South Lake and were to be picked up by the packer a week later. Philip, now six years old, rode a horse by himself. The Annises took their two- and four-year-old daughters in by the simple expedient of each one's holding a child on the saddle. This method of travel proved to be quite satisfactory although it cannot be recommended for extended trips.

We found what appeared to be an ideal campsite but almost as soon as the packer disappeared over the skyline the mosquitoes descended in force. During the term of our stay we were seldom free from their enthusiastic attendance and we said unkind things about the lack of facilities for moving a few short miles to Little Pete Meadow, which we knew to be mosquito free.

To top things off, the youngest child contracted an infection which

made it necessary for her father to hike out and return with the pack train three days ahead of schedule. All things considered we now prefer taking our own stock. The freedom to stop or move on as fancy dictates more than compensates for the extra work required to handle the animals.

CHILDREN AND THE SIERRA

One pertinent question frequently asked may be phrased as follows: how much value and enjoyment does the very young child get out of a mountain trip? One wonders whether the parents are only hopefully extrapolating their own enjoyment or whether the youngster really has a good enough time to compensate for the extra work and planning.

One cannot answer for all children, but our boy had the time of his life at the tender age of two. True, his interests and occupations were relatively limited but he had a grand time nevertheless. It has been most interesting to follow his development from year to year.

At the age of two his interest in the scenery was limited to observations on the "rocks" (cliffs) and the roaring streams. He had a fine time scrambling over the boulders around camp and many happy hours were spent with a pile of pine cones, pebbles, and chips of wood. His greatest joy was to splash madly about in warm marshy pools and the high point of his trip came when we let him wade up and down a gurgling brooklet all of a foot wide and three inches deep. What utter and complete bliss! His first sight of a car after ten days on the trail was the occasion for so much excitement that we feared it expressed a preference for a more mechanized life. At the end of the trip, however, he felt badly when we gave up our pack burros; and when he saw his riding seat being unlashed from the pack frame and realized the trip was over, he howled with anguish. Going home held no attractions for him!

I saw this same reaction several years later. In this case it was three-year-old Carol Annis on her first outing. She had been a little doubtful at the start of the trip. She was "cold" and home was mentioned several times. Two weeks later when we struck camp for the last time she sensed what was going on and wept copiously. Only hasty promises to set up the tent that night brought peace and quiet.

At the age of three Philip took great pride and interest in his saddle burro. Judy, the burro, spent a considerable amount of time being led around various meadows by a solemn and very proud child. In return for her patient overtime work she received extra scraps from the camp table. Philip particularly enjoyed wading in the icy mountain streams and would continue to splash back and forth long after admitting his feet

were "all frozen." Helping daddy fish was a favorite occupation and when he was found one day sitting peacefully beside the stream holding a gnarled stick, one end of which rested in the water, he explained that he was catching trout.

As a four-year-old he was provided with a "rod" consisting of a cheap reel, a piece of doweling, and an old rod handle. He hooked several fish and with a little assistance pulled out a couple. The others escaped while the rest of the family capered on the bank imploring him to pull in his line. His play habits were more advanced and much time was spent in shallow pools and lakelets pushing logs about, digging channels through the sand, and diverting little streams through them by means of dams. Frogs and tadpoles came in for a lot of attention. He began to be of help around camp. A short cross-country hike was tried but after about a mile he lost interest.

At the age of five there was an increasing interest in the flowers, streams, etc. Fishing became very important and he pulled in several without any paternal help. There was considerable rain and he and three-year-old Carol spent much time constructing sand castles, roads, trails, etc. A snow man had to be built and the usual quota of logs had to be shoved in and out of bays, estuaries, and docks.

In 1947, when he was six, we made an interesting experiment. An eleven-year-old boy, Richie Johnson, whose camping experience was limited to Yosemite Valley, was invited to go with us. Mr. and Mrs. Annis and their two girls completed the party. Our base camp was set up in Dusy Basin. The two boys rode their own horses and considered themselves blends of the Lone Ranger, Red Ryder, and the Northwest Mounted. Both of them did handle their mounts well and Richie was a real help in leading the animals over snowbanks and rough spots in the trail.

Around camp all four children got on well and the boys kept an eye on the girls to see that they stayed out of the brook and away from overly-high boulders. We took the boys hiking and swimming one day and at the same time the Annises took Carol and Charlotte for a long walk. As on previous trips the two couples took turns staying in camp. This arrangement freed the adults for a bit of mountain climbing.

All four children went peacefully off to their beds at the proper time each night. There was no sense of fear, although the campfire was fifty or more feet away. Also, the boys' beds were some distance from ours. Where the parents themselves have a real love for the out-of-doors their attitude apparently communicates itself to the children. Many inexperi-

enced adults have expressed their fear of encountering snakes, bears, and other wild animals. Not so with the kids. We have yet to meet the problem of a child who was really afraid to sleep out on the ground or to meet wild animals (real, not imaginary ones).

For the boys the climax of the trip occurred at Tuolumne Meadows, where we stopped over for two days on the way home. The first day was spent along the river. The boys soon found two good logs so some rope was procured from camp and presto, they had a raft. Shades of Tom Sawyer and Huck Finn! They floated merrily along, sideways, backwards, and sometimes even frontwards. Now and again they pushed and hauled their raft across shallow spots and then tumbled aboard as deep water was reached. We followed along the bank taking pictures and shouting with laughter at their antics. After lunch on a sand bar the raft was launched again and would doubtless have continued to the very edge of the first cascades had we not insisted on a stop to avoid excessive exposure to the Sierra sun.

On the last day Richie and I climbed Mount Dana. The weather was perfect and our leisurely pace brought us to the top just in time for lunch. Peaks, lakes, and canyons were identified, pictures taken and the club register was properly signed. The bone-jarring descent was without incident and by mid-afternoon we were back in camp. I established to my satisfaction that a normal, healthy eleven-year-old boy can take such a climb in his stride.

Despite all that has been said many will still ask, "is it worth the trouble?" When Bernice and I think back over the years the momentary problems that we had are, like mosquitoes, rain, and sand in the soup, but dim memories. Our sense of family unity has been strengthened by our experiences in common. Philip has come to consider the mountain meadows, the hanging gardens, the emerald and sapphire lakes, and the sky-reaching peaks a part of his heritage. They are in his blood as in ours. It has certainly been worth it!



"Go and Look Behind the Ranges"

By JOHN THOMAS HOWELL

FOR THOSE of us who live west of the Sierra Nevada a journey behind the range is necessary if we are fully to appreciate the wonders that are to be found there.

Members of the 1947 Base Camp had the privilege of exploring as intensively as they might wish an outstanding section of this eastern front, and, because the opportunity was so unusual, I restricted my miscellaneous observations (chiefly botanical) entirely to that slope. I didn't even climb to Jigsaw Pass on the Sierra crest for the view westward into Dusy Basin (and certainly I didn't aspire to the sterile summits of Sill, North Palisade, or Thunderbolt), but rather I confined my cony-like comings and goings entirely to the region about the Big Pine and Baker lakes with the Inconsolable Range and Coyote Ridge the high points of my summer. That I restricted my attention so exclusively to the hinterland of the Sierra may be regarded as only a minor matter with a modicum of personal scientific interest, but to enter the mountains from the Owens Valley for the first time was for me a revelation. In my experience, the southern scarp front of our range with its unique botanical and geological features had been an unknown: in 1947 not only did I go and look behind the range, but I found "something hidden . . . something lost . . . and waiting . . ."

The Sierra Nevada has been described as one of the largest single fault block ranges in the world, both in area and in altitude, so it is to be expected that the fault front along which the mountains have been developed would be spectacular. And we, who have gone behind the range, have not been disappointed in the grandeur of that escarpment. There, from desert flat or sagebrush knoll, we behold one of the great mountain walls of the world, one to two miles in height and more than a hundred miles long—the serrated peaks etched against the sky, the buttressed slopes adorned with jagged crags and forest fringes, the gaping canyons choked by alluvial débris and festooned by mountainous moraines; ever grand, in calm or storm, laden with winter snow or shining in summer sun. (See *SCB*, 22:1 [1937], plate ix.)

How different is this rugged soaring massif in contrast with the broad western front with its relatively gentle (albeit magnificently sculptured) slope, its mighty groves, ample meadows, and rolling foothills reaching down almost to sea level!

Our range is actually only a part of a much vaster geological structure in which Owens Valley lies as a great trough or graben between the up-lifted Sierra Nevada on the west and the White Mountains and Inyo Range on the east. In faulted regions, this kind of valley is not uncommon; another California trough similar in structure is Death Valley, and in the Old World, a famous graben has in its depths the Dead Sea. Geologists long ago recognized and described the fault-block structure of Owens Valley and its bounding ranges, but if the majesty of those mountain fronts is still unknown to you, go and look behind the Sierra and discover for yourself, as I did, the beauty, the power, and the glory that will be yours for the understanding.

Behind the Sierra we also find the rain shadow cast by the range on lands at its base and far to the eastward. Winds from the Pacific deposit their burden of moisture on the western slope and along the crest and then descend to the valleys and plateaus of the interior, thirsty and absorbent instead of saturated and soaking. This marked climatic effect of the range frequently finds meteorologic expression in dramatic cloud effects in summer as well as winter when storms rage along the summit ridges but pass no farther eastward. (See *SCB*, 25:1 [1940], plate facing page 15). Because the range exerts so definite a climatic influence, we find desert conditions and desert plants reaching the base of the eastern escarpment, advancing into the canyons along alluvial fans, and even mounting the rocky slopes. Mojave mariposas raise their flaming cups on valley flats below the snow-encrusted peaks and fragrant sagebrush climbs from desert mesas to rocky ridges and moraines. From desiccated flats on the valley floor, our entire perception may be impelled by forest-fringed ledges and alpine summits a mile or more above us, but the xerophilous plants and animals on the scorched rocks and thirsty sands about us are vital reminders that the roots of our range are buried in a desert begotten of itself.

One of the things I discovered early in the 1947 Base Camp was that the desert influence climbs high along the eastern front of the Sierra, and before the outing was over I was to find that that influence could be discerned even on alpine ridges above timberline. From the end of the road, the trail up Big Pine Creek climbs an abrupt glacier step in the bottom of the wild and rugged canyon and quickly attains an elevation of about 9,000 feet. Those who might have thought that they had left the desert and its plants on the floor of Owens Valley a vertical mile below were scarcely prepared for what was found, for here flourishing in granitic rubble on the sun-drenched slope was a cactus as real and as spiny as

any found on the Coachella or in the Panamints. True, the plants were low-growing, mostly less than a foot tall, but they were numerous and by their profusion they proclaimed to all who would look and think that the Sierra Nevada is the westernmost of the desert ranges and that its eastern front offers a congenial home for those Spartan plants and animals which prefer the rigors of aridity to the soft opulence of humidity.

As for this particular desert indicator, it was *Opuntia erinacea*, which in an extreme form with many long spines is popularly known as old man cactus because of the shaggy bearded appearance of its very spiny joints. The species is not uncommon in the higher desert ranges to the south and east (according to Jepson's *Flora* occurring eastward from the Panamint Range), but our 1947 collection apparently represents the first record of the plant from the Sierra Nevada. Surely other botanists who have climbed the Owens Valley escarpment must have seen these plants so fiercely eloquent of their desert lineage, but perhaps those before me passed them by as not a part of the Sierra flora, something exotic and foreign to be ignored—desert demons engendered to bedevil a botanist aspiring to the heavenly pastures of upland slopes and meadows! Those botanists have gone behind our range and looked but they have not seen all. Only too likely, preconceived notions and floristic prejudices carried over from the more familiar vegetation of the broad western slope have blurred their vision, and that undeniable stamp which aridity has placed upon our range is either minimized or ignored.

As we proceeded up the trail to our campsite in the Big Pine Lakes Basin at Fifth Lake, another sort of aridity became apparent, the blight of drought on canyon meadows and slopes that should have been lush. The differences between the dryness of the cactus slope and the dryness of the alpine meadows and subalpine rock gardens were fundamental—the differences that are between climate and weather, between eons and days, between the phylogeny of species and the ontogeny of individuals. Rocks where water should have dripped were dry, moss gardens where water should have seeped were shriveled, upland meadows where water should have oozed were sere. Deficient winter snowfall followed by a dry spring and summer had produced unmistakable evidences of drought, not only on the east slope of the Sierra in the drainage of Big Pine Creek but also throughout the length and breadth of the range. In those boggy meadows where grasses, sedges, and rushes thrive, a still different effect of the drought was apparent. Although there was an adequate supply of water for the hydrophilous inhabitants, their flower clusters were withered, their fruit receptacles empty or aborted. These plants, falsely

encouraged by the early melting of the scant snow and the resulting springlike conditions, had developed prematurely and their expanding crowns had been blasted by freezing temperatures from which a normal snow blanket would have protected them. While so many plants had suffered from the seasonal aberration of the weather, our Sierra cactus, inured to drought through age-old climatic adaptation, seemed scatheless.

In this part of the Sierra, high ridges from 12,000 to over 13,000 feet extend northward and eastward from the crest of the range and add to the ruggedness of the region. Although they are not much lower than the main Sierra divide, they are definitely to the east of it and over them too is cast the rain shadow which becomes ever more pronounced the farther east one goes. While these spur ranges receive much more precipitation than the White Mountains directly to the east across Owens Valley, these ridges and the high broad mesa-like shoulders that bound them have assumed an aspect not generally associated with the High Sierra but rather a xerotic facies not unlike that found along the summit ridges and elevated uplands of the White Mountains themselves.

This climatic and physiographic resemblance between the high country on either side of the Owens Valley trough is also reflected in the flora, for in this part of the Sierra are found a few plants that in California are known otherwise only in the White Mountains. Two of these plants belong to the leguminous genus, *Oxytropis*, a group which is widespread through most of western North America but whose few California representatives have a most limited occurrence in the state. I was quite prepared to find *Oxytropis viscida*, with its sticky fragrant leaves and violet flowers, because it had been known from the Baker Lakes region and Hans Leschke had collected it on Coyote Ridge. Indeed it would have been a real disappointment had I not found this plant, which, although it has been dispersed across North America from Alaska to Quebec, has been unable to spread beyond so limited an area in the Sierra Nevada. One cannot help but ponder why it has remained so restricted because it is locally common and flourishing on the broad tableland of Coyote Ridge and on the ancient morainal slopes of the Inconsolable Range. It may be that its Sierra distribution is entirely controlled by delicate physiographic and climatic interrelations found only in this high desert borderland.

While I was expecting to find the rare and local *Oxytropis viscida*, I was quite unprepared to find a second species, *Oxytropis Parryi*, a plant heretofore reported in California only from Sheep Mountain in the White Mountains, a new and exciting plant discovery for the Sierra Nevada. Here again was a plant restricted to Coyote Ridge and to the morainal

outskirts of the Inconsolable Range but beyond California widely distributed through high desert mountains to the Rocky Mountains from Wyoming to New Mexico. Unlike its congener, *Oxytropis viscida*, which was vigorous, floriferous, and relatively showy, *Oxytropis Parryi* was a depressed dwarf scarcely to be distinguished on the tundra-like flat among the low condensed buckwheats, drabas, phloxes, and daisies with which it grew. Undoubtedly the special conditions effecting the localized distribution of *Oxytropis viscida* in the Sierra Nevada have exerted a similar controlling influence on *Oxytropis Parryi*.

The occurrence of these and certain other rare plants in the White Mountains and in the Sierra Nevada raise in the botanical explorer the hope that still other desert species may be discovered on these little-known spurs of our range. What an event it would be to discover among the easternmost rocks of Coyote Ridge the White Mountain sky pilot, *Polemonium chartaceum*! But the botanical triumph in this phytogeographic game of hide-and-seek would be the discovery of the minute desert annual, *Gymnosteris minuscula*, on the gravelly ridges of the Baker Lake Basin or on the broad sandy flats of Sanger Meadow to the northeast. Here is a rarity (known, in all the world, only from the White Mountains) whose size will be in inverse proportion to that burst of enthusiasm which will greet its discovery in the Sierra.

The possibility of discovering another desert plant on the eastern spurs and shoulders of the Sierra Nevada is an almost irresistible lure to go and look again behind the range. *Oxytropis Parryi* was a prize—does yet another “waste its sweetness on the desert air”?

Hans Huth and His Story

YOSEMITE: THE STORY OF AN IDEA" is one of the most important contributions to the history of the national park idea that has been made in recent years.

For one thing, Dr. Huth, in reiterating that Yosemite, not Yellowstone, was the first park of national importance, has made it imperative that future historians abandon the common assumption that the national park idea was born at a campfire in Yellowstone in 1870. Six years before that campfire, Congressional action had already been taken to set aside Yosemite Valley, that it might be enjoyed in perpetuity as a scenic resource for all the people. The proper place of Yosemite in national park chronology is pointed out by Dr. Carl Russell in *One Hundred Years in Yosemite*. It is of major importance here that Huth traces the course of man's interest in nature in this country and demonstrates that no other chronology was possible. He shows the importance of Yosemite not only as a birthplace of an idea, but also as a place where the idea could grow.

Perhaps Hans Huth's insight with respect to our national parks is due to his not having grown up among them. He obtained his Ph.D. in Berlin in 1922 and by 1936 had been a curator in the museums of Munich and Berlin and the former Royal Palaces and Gardens in Prussia. He came to this country in 1938, having been invited to lecture at New York University and collaborate in history with the National Park Service, by which he was later appointed consultant. Now Associate Curator of the Art Institute of Chicago, he has published books on decorative arts, sculpture, and gardens, and has contributed to historical and art periodicals here and abroad.

Germany has respected cultural objects for generations and has interpreted historic relics for students and the average citizens in an organized way. Huth could see readily enough the practicability of using historic objects as teaching materials in the United States; they could also serve as a type of documentary evidence against which the written word could be checked. He has been instrumental in initiating this method in this country. At the same time, he has manifested great interest in nature protection. He has combined his several interests in "Yosemite: The Story of an Idea." It is important that the results of his objective study of a park he has never seen be published now, when too many others who have not seen our scenic resources are opposing the concepts and attempting to negate the action of the men of vision of whom he writes.

—DAVID R. BROWER

Yosemite: The Story of an Idea

By HANS HUTH

I. INTRODUCTION

THEODORE ROOSEVELT gave status to conservation as national policy by creating, in 1908, the National Conservation Commission. The importance of what he had done did not really engage the public mind until the Dust Bowl catastrophe of the early 'thirties. Only then did the nation learn what it means to have the heavy topsoil of the plains, no longer protected by the original vegetation, carried away by the Mississippi and poured into the Gulf of Mexico. The dramatization in the Dust Bowl of what might be termed a cumulative calamity served to advance the conservation of the nation's natural resources and the preservation of the educational and recreational values inherent in state and federal parks. The preservation of these values had been initiated at the now famous Conference of Governors in 1908 through the leadership of J. Horace McFarland, at that time President of the American Civic Association. He was the only representative who was farsighted enough to recommend guarding the national domain for its scenic value, which he felt represented "a distinctly important natural resource." From this time on, the American Civic Association became active in arousing sentiment in favor of establishing a bureau of national parks. Appropriate legislation was finally drafted and passed by Congress in 1916.

In the course of the growth of the National Park System it has been frequently stated that with the establishment of Yellowstone National Park in 1874, the idea of national parks was born. More specifically, it has been said that members of the Washburn-Doane Expedition of 1870, in a campfire discussion in Yellowstone, laid the foundation for the national park pattern, and that from there on, like apostles, they carried the new gospel to the people.

If things really had happened this way, it would indeed have been something of a miracle. It would have meant that public opinion had been prepared for this supposedly new and unique idea in little more than a year, and that Congress was ready to act favorably "to set apart the vast territory of Yellowstone as a public park or pleasuring ground for the benefit and enjoyment of the people." Ideas of such far-reaching consequence do not ripen overnight; they develop slowly. Any attempt to elucidate the evolution of the national park idea must start by exploring two different processes. One is the legal procedure used for transforming

an area into a park for public use, as exemplified in the history of the setting up of Yosemite or Yellowstone as segregated areas under state or federal authority. The other is a process which seems more important and has been given little attention—the shaping of public opinion so that it will either demand or suffer conservation measures. Contrary to the usual assumption, it was not the establishment of Yellowstone but rather the setting apart of Yosemite which was preëminent in the basic conditioning of opinion. Yosemite is the point of departure from which a new idea began to gain momentum. Where the idea will lead can hardly be envisaged, but we do know that the manner in which the entire park system developed in this country is specifically American; the system is an institution admirably suited to fill the needs of the people.

II. THE AMERICAN AND NATURE

WHAT WAS the attitude of the colonials toward nature, and how did it develop later? To find the answer to this question we could make a detailed study of the treatment of nature in early colonial literature; but it should suffice here to pick out a few significant opinions. Of course we need not stop to inquire about the pioneers' point of view. They blazed the way and were forced to be uncompromising; they consequently rejected in nature that which was not of immediate and practical use—a philosophy borne out in a little poem published in 1692:

In such a wilderness . . .
When we began to clear the Land . . .
Then with the Ax, with Might and Strength,
The trees so thick and strong . . .
We laid them all along . . .
[These] we with Fire, most furiously
To Ashes did confound.¹

We might also mention one Reverend Johannes Megapolensis, who visited the Cohoes Falls in 1644. Taking no delight in the extraordinary sight of nature, he noticed nothing save the obvious consequences brought about by the descending mass of water. To him, the boiling and dashing water made only a horrible noise and the trees looked as if they were standing in the rain.² To traveler and settler alike, nature seemed uncouth in the extreme, and they felt that they were in a "most howling wilderness amidst wild men and beasts."³ Toward the beginning of the eighteenth century there were occasional changes in this attitude, even in the core of Puritan stock. For example, Jonathan Edwards, the Connecticut minister, who was dismissed from his pulpit for his too strict

adherence to the Puritan dogma, rather freely expressed his deep love for the beauties of nature which he considered an emanation of the Son of God. "We behold the fragrant rose and lily . . . the easiness and naturalness of trees and rivers are shadows of His beauty . . . the golden edges of an evening cloud . . . the blue sky . . . the ragged rocks . . . and the brows of mountains."⁴ While such sentiments apparently were admitted in disguised form, a New Englander ordinarily would have frowned on the enjoyment of nature as a pastime, since it would have been neither "useful" nor "innocent," but plain wasteful, and therefore vicious and leading to excess and sin. Southerners, of course, were more tolerant, but still contemplations of nature were rare before 1750. Perhaps we may evaluate in this context a statement made by Colonel William Byrd, the owner of Westover, to whom the ideal goal of a Southern gentleman was the possession of "a library, a garden, a grove, and a purling stream." How far such desires indicate any special addiction to nature is difficult to define. Certainly we do not find one line in Byrd's *History of the Dividing Line* (1728-1736) which would prove any special interest in nature. The few such statements we do find in colonial literature are simple and lack expressive power. Only in the second half of the eighteenth century did writers express more clearly defined thoughts about their relations with nature. We must be wary, however, of the *à la mode* stylists, who cannot be considered as being sincere inasmuch as their conventionalized pastoral sentiments did not spring from any newly won or intimate relations with nature.

What we must study are the writings of such men as William Bartram, Hector St. Jean de Crèvecoeur, Alexander Wilson, and Philip Freneau. All these men came into close contact with nature by profession as well as by avocation, and all of them were conscious of the newness of their adventure on being confronted with virgin woods, savannahs, and lakes, not previously charted by white men. They as well as their readers had been prepared for their fresh experience by the works of English deists, such as Lord Shaftesbury, who had shaped their minds to perceive the possibility of a new kind of relationship between man and nature. At the same time they became acquainted with critics of the type of Edward Burke, whose recognition that a quality like "sublimity" should be coordinated with the beautiful, laid the foundation for a new aesthetic doctrine which was immediately taken up and applied. A little later the English Reverend William Gilpin became known as the erudite who had spent years in search and description of the "Picturesque." Scarcely any writer on "nature" in the beginning of the nineteenth century failed to

follow him and use his vocabulary. Only after the integration of such new definitions were writers properly equipped to furnish more unconventional and precise appraisals of nature. Imbued with this new spirit, William Bartram, 1739-1823, traveling between 1773 and 1777, asked his countrymen to behold "as yet unmodified by the hand of man . . . the unlimited variety and truly astonishing scenes of landscape and perspective."⁵

Bartram's deeply felt emotions led him through all sensations of "vastness" and he would lose himself completely "amidst sublimely high forests, awful shades."⁶ His travel accounts, first printed in Philadelphia in 1791, did not find widespread recognition among his contemporaries; still it was he who strongly influenced Chateaubriand, and, much later, his view was one of the decisive factors in shaping Thoreau's ideas.

Philip Freneau's poems (1752-1832) dealing with nature subjects are still well known, and it is unnecessary to single out any of them to show how well suited they were to persuading his fellow countrymen to share his deep devotion to nature. In Alexander Wilson's (1766-1813) epic poem, "The Foresters, Descriptive of a Pedestrian Tour to the Niagara," even the title reveals an attitude toward the natural wonders of this country. The poem is not well remembered now and probably was never very popular. But Wilson himself, wandering up and down the seaboard states and penetrating into remote places to peddle subscriptions to his bird publications, was a well-known figure and a most eloquent advocate in the propagation of love for and interest in the beauties of nature. In his time the public knew Wilson far better than they did his competitor, Audubon, who came into public view and gained a certain popularity much later.

Among the scores of travelers who roamed through the country for various purposes, it is easy to pick out some who took real interest in the scenes with which they were confronted. From Andrew Burnaby (traveled in 1759-1760) on, these men displayed increasing amazement at the wonders of natural grandeur which they beheld. St. Jean de Crève-cœur (1731-1813) hates to dwell in "accumulated and crowded cities" and enjoys "in our woods a substantial happiness which the wonders of art cannot communicate."⁷ To visitors beholding Natural Bridge in Virginia for the first time, it is, according to Thomas Jefferson, impossible for their emotions "arising from the sublime to be felt beyond what they are here . . . the rapture of the spectator is really indescribable."⁸ To understand this praise we must realize that Natural Bridge was one of those objects to which a "curio" value had attached. The appreciation of this

value, which has nothing to do with the aesthetic or sentimental merit of an object, was one of long standing. It had interested travelers the world over, ever since they had first set out on pilgrimages. Trenton Falls, Mammoth Cave, and, of course, Niagara Falls were some of the other places in this country regarded as "curious" and "landmarks," to be seen by every foreign traveler. So in evaluating the "raptures" of travelers, we must be careful to distinguish mere delight in a curio value from the growing appreciation of scenic qualities of nature. In the travel accounts of Timothy Dwight, president of Yale in 1795, we are immediately reassured that the joy he expressed in the sights he beheld was genuine. An untiring traveler of the American countryside, he wandered "with emotions, similar to those with which, when a child, he roamed through the wilderness."⁹

Evaluation of the attitudes toward nature of writers of the early nineteenth century is difficult only because it becomes hard to know whom to select among the many who were taking an increasing interest in the American scene. Above all is of course James Fenimore Cooper, whose *Pioneers* must be regarded as one of the most significant books in this respect. Here is one of its typical passages in which Natty Bumpo expresses his feelings:

... "when I felt lonesome . . . I would go into the Catskills and spend a few days on that hill . . ." "What see you when you get there?" asked Edwards . . . "Creation, lad, all creation," said Natty. "How should a man who has lived in towns . . . know anything about the wonders of the woods? . . . None know how often the hand of God is seen in the wilderness, but them that rove it for a man's life."¹⁰

A study of William Cullen Bryant's (1794-1878) poems will clearly prove that devotion to nature was one of his outstanding characteristics. This devotion is early expressed in "Thanatopsis," and it is later confirmed by James Russell Lowell who hailed the dean of American poets on his seventieth birthday:

The voice of the hills did his obey;
The torrents flashed and trembled in his song;
He brought our native fields from far away . . .

While much interest has been shown lately in Thomas Cole's painting (1801-1848), some attention should also be given to his journals for their warmhearted descriptions of the "sublimity of untamed wilderness, and majesty of the eternal mountains."¹¹ But Cole did not confide his thoughts only to his journal; we know at least of one lecture on "American Scenery," which he gave in 1835 before the New York Lyceum.¹² Though we do not know the contents of this paper, we can well imagine

how Cole talked about "primeval forests, virgin lakes and waterfalls," feasting his eye and being hallowed "to his soul by their freshness from the creation."¹³

Another romantic writer was Charles Fenno Hoffmann (1806-1884), the first editor of *Knickerbocker Magazine*. In 1834 he set out all alone to travel west on horseback. He too was enchanted by the beauty nature had lavished on the country and asked, "Why are there none to sing her primeval glories in our land?"¹⁴ More important, however, was George Catlin (1796-1872), another untiring explorer and painter, whose particular interest lay in the "looks and customs of the vanishing races of native man in America." Traveling up the Missouri River into the heart of the Indian country (1832), Catlin beheld the vast forest covering the banks of the river and he, perhaps as the first man in this country to do so, had the imagination to conceive the idea that these realms "might in future be seen (by some great protecting policy of government) preserved in their pristine beauty and wildness, in a *magnificent park*, where the world could see for ages to come, the native Indian in his classic attire, galloping his wild horse . . . amid the fleeting herds of elks and buffaloes. What a beautiful and thrilling specimen for America to preserve and hold up to the view of her refined citizens and the world, in future ages! A *nation's Park*, containing man and beast, in all the wild and freshness of their nature's beauty."¹⁵ This passage was first published in one of the letters Catlin sent to the *New York Daily Commercial Advertiser* in 1833 from the Indian Territory. Thus was planted the seed of an idea which, although it took more than three decades to develop, was immediately well circulated in the widely read New York newspaper.

Henry Thoreau's *Walden* and the thirty volumes of his journal dedicated to recording observations on nature should be enough to show his interest in our problem. In one of his most pertinent passages he wrote:

Why should not we . . . have our national preserves . . . in which the bear and panther, and some even of the hunter race, may still exist, and not be "civilized off the face of the earth" . . . for inspiration and our true re-creation? Or should we, like villains, grub them all up for poaching on our own national domains?¹⁶

Of Emerson's many statements concerning either his appreciation or his deep understanding of nature and the intrinsic qualities of his native soil, one might quote a remark he made in his Boston lecture about "The Young American" (1844) as reported in the *Dial*: "The interminable forests should become graceful parks, for use and delight."¹⁷ This passage, deleted in later book versions, seems to be the one publicly pronounced which follows Catlin's postulate of 1833 most closely. Cole took

up the same idea by stating that "Americans have a strong desire for excellence . . . a love of nature . . . one cause of it—the wilderness passing away and the necessity of saving and perpetuating its features."¹⁸ All these remarks show that by the middle of the century, growing numbers of people not only had begun to take interest in the outdoors but also had realized that conservation measures were becoming necessary. The art critic, Tuckerman, corroborates this change in public opinion by pointing out how healthful "a lengthened sojourn in the primeval forests would be for refreshment and inspiration."¹⁹ Now at last the opportunity to enjoy the uncharted wilderness was no longer thought to be the exclusive privilege of the romantically minded traveler or artist.

The efforts of artists to interest the public in the great outdoors began very much later than those of writers. At first the artists were definitely carried away by the romantic movement which came to the fore at the beginning of the nineteenth century. Before that time landscape painting in this country was almost nonexistent, since only portraits or historical paintings were held worthy of the profession. Perhaps some of the landed gentlemen had their country seats depicted, or occasionally some of the harbor towns and other sites of interest were painted and then engraved to show their topography. But "landscapes" as such were not yet generally appreciated and some English landscapists who came to this country to try out the field failed miserably in spite of the fact that one, William Winstanley, had been recognized by George Washington and had been recommended in 1793 to the Commissioner of the District of Columbia to paint "grand objects" such as the Great and Little Falls and Natural Bridge. Washington himself, encouragingly, had bought some of Winstanley's "Landskips."²⁰ Perhaps the first painter who did landscapes in a truly romantic mood, because he was enchanted by the American scene, was John Neagle, of Philadelphia (1796-1865). However, Neagle painted landscapes only as a sideline and never exercised any real influence, nor was he recognized as a landscapist outside his small circle. Only after 1825, when Cole had shown his landscapes in New York, did the public really become interested in the products of this new school of professional landscapists, later to be known as the Hudson River School. As Cole expressed it in 1835, "The painter of American scenery has, indeed, privileges superior to any other. All nature here is new to art."²¹ To understand the sudden turn which public interest took during this period, we must recall such factors as the publication of Irving's *Sketchbook* in 1819-1820, Cooper's *Pioneers* in 1823, and *The Last of the Mohicans* in 1826. With such books capturing strong public interest, it seems logical

that thereafter paintings representing scenic objects should have been well received. Several series of prints showing landscape paintings were published after 1820; the most important of these, though it proved to be a failure, was Asher Durand's *The American Landscape* in 1830.

In the prospectus of this album, Bryant expressed the feeling that there was no want of taste in the community to ensure the most successful results to an "undertaking [to publish] the most prominent and interesting features of our varied scenery."²² In many titles of such publications we find the word "picturesque." Even Bryant's monumental book on the American scene, published as late as 1872, carried the title, *Picturesque America*. By this time, however, the term picturesque, an heirloom from eighteenth-century terminology, no longer was used with discrimination, and artists made fun of it:

To prose it here, to verse it there
And picturesque is everywhere.

Certainly the term was no longer characteristic of the work of American artists picturing their country and so advancing the knowledge of it. In the years following the early romantic period, artists on the one hand endeavored to show realistically what Cooper as early as 1828 had called "the American scene, embracing all that admixture of civilization and of the forest, of the works of man, and of the reign of nature, that one can so easily imagine to belong to this country";²³ or, on the other hand, and somewhat later, they were out to paint "heroic landscapes." These "grand style" objects presented by Church, Bierstadt, Kensett, and Moran, might be described with Catlin's words as "the vast and vacant wilds which lie between the trodden haunts of present savage and civil life—the great and almost boundless garden spots of earth . . . the boundless plains of beauty and Nature's richest livery."²⁴ However varied artistic conceptions may have been, the resulting pictures were important factors in stimulating the public to take an interest in nature beyond its common utilitarian aspect. Aware of the basic facts underlying this gradual educational process, Emerson, apparently somewhat amazed by his own observations, did some explaining in his journal of October 13, 1837: "New Eyes. What is, appears. Go out to walk with a painter, and you shall see for the first time groups, colors, clouds, and keepings, and shall have the pleasure of discovering resources in a hitherto barren ground, of finding as good as a new sense in such skill to use an old one."²⁵ But Emerson did not stay content merely to acquire a new aptitude for his eyes, he was willing also to draw a moral implication from this fresh way of considering nature. He adapted Gilpin's problem of "searching the picturesque"

to his own newly won conception and proceeded to apply it: "Our hunting for the picturesque is inseparable from our protest against false society."²⁶ Generally speaking this was no new idea, since the *litterateurs* of the romantic movement had pronounced thoughts which were similar; however, in Emerson's close study of nature with his "new eyes," the idea is seen to be a new and consequential one.

We may get an even closer view of what was going on in the minds of Americans by analyzing some statements made around 1850, when writers noticeably began to look beyond the romantic aspect of nature and to grasp the specific esthetic values of the American scene. Undoubtedly this was at first done rather reluctantly. Even Cooper, who we might expect to say that the Rocky Mountains "must possess many noble views," thought that nevertheless "the accessories are necessarily wanting, for a union of art and nature can alone render scenery perfect." But then he goes on to admit that "the mountain scenery of the United States, though wanting in grandeur . . . is not without attractions that are singularly its own."²⁷ In George William Curtis we find the same cleavage of opinion. In his book, *Lotus-Eating: A Summer-Book*, devoted to the pleasure of traveling in this country, he compares the beauty of Lake Como and Lake George. Remarking that there is a "positive want of the picturesque in American scenery and life," Curtis goes on to make the remarkable statement that there should be another level of comparison than the one ordinarily used. Picturesqueness should not be the yardstick; but "space and wildness are the proper praises of American scenery . . . We have only vast and unimproved extent, and the interest with which the possible grandeur of a mysterious future may invest it."²⁸

To gauge the progressiveness of such thoughts one should compare them with what John Ruskin, the recognized European arbiter of taste, told his friend, Charles Eliot Norton, in 1856, "I have just been seeing a number of landscapes by an American painter of some repute; and the ugliness of them is wonderful. I see that they are true studies and that the ugliness of the country must be unfathomable."²⁹ In 1871, Ruskin supplemented this statement by another seeming equally strange: "I have kind invitations enough to visit America, I could not even for a couple of months live in a country so miserable as to possess no castles."³⁰ So much cynicism and candor would be difficult to excuse if there were not Cooper's or better still Curtis's explanation by which to judge Ruskin's *dicta*. After all, Curtis's point of view was not so very different from Ruskin's, since they both agree to the superiority of European scenery in certain respects. But beyond this Curtis recognized that the American land-

scape had quite specific attributes, such as Ruskin had never experienced and therefore could not realize. Agreeing with Emerson, Curtis felt that the landscape of the Western Hemisphere had very peculiar qualities, not merely of esthetic value but of vast social importance for the future. Altogether, Americans were to be considered as having a great natural advantage over Europeans. Artists were certainly ready to appreciate this and to help prepare the public to use "new eyes," which through their efforts were gradually to become common property. Going out west to the Rockies and beyond, as well as to the north, painters were "discarding conventionalism . . . [taking] . . . nature in her beautiful American wilderness as their model . . . [making] . . . the woods and fields their studio . . . daring to paint trees green."³¹

It must be admitted that the process of inducing the public to visualize the great outdoors as a pleasure ground was slow, and not only Britons made gross misjudgments. As late as 1864, Tuckerman feared that "the American of education . . . who delights in the life and takes pride in the aspect of his native land, is the exception, not the rule . . . [because] there is too much monotony in the landscape . . . excepting certain shrines of pilgrimage long consecrated to enthusiasm."³²

The early representatives of romanticism had influenced the public not only through their pictures and writings, but also by their way of living in the regions they had chosen to paint. Cole, by residing in the Catskills even during wintertime, "in search of the wintry picturesque,"³³ had incited other romantically inclined people to do likewise. By 1825 there were enough enthusiasts to patronize a hotel, the Mountain House, put up in the Catskills for no other purpose than to serve these Idealists in the pursuit of their nature cult—and the customers were awakened every morning to enjoy the sunrise. What a change since Dwight's travels through the Catskills! In 1804 he only "occasionally passed a cottage and heard the distant sound of an axe and of a human voice . . . All else was grandeur, gloom and solitude. The mountains seem to shut out the few inhabitants from the rest of mankind like in Switzerland."³⁴ In 1828 the *Atlantic Souvenir* published an account of a visit to the Catskills in which the American was admonished not to "leave this land for enjoyment, when he can view the rugged wildness of her mountains, admire the beauty of her cultured plains . . ." Theodore Dwight, a Hartford publisher and nephew of the Yale president, visited the Mountain House in 1834 and described the sunrise rites: "As soon as I could perceive the first blush of dawn, I dressed, and hastened to the roof of the hotel, to watch the approach of the day . . . There was more sublimity to be feasted upon

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every moment that passed, than some people witness in their whole lives."³⁵

As if to answer the need for education to make people "see," a curious book, *The Scene-Shower*, was published in 1844 by one Warren Burton. He wanted the public to be properly sensitive to landscape beauty. While the "scenery school" he suggested was never established, his book confirms the change in the public attitude. No longer did only the select few indulge in romantic travel and the "Saratoga crowd" take a cure at a spa; we find instead, according to *Harper's Monthly*, that by 1854 various resorts had their staple attractions like the Mountain House's "sunrising," and just about everybody taking them in.³⁶

One of the reasons for this change was that traveling along the seaboard states had become easier. As long as the roads had been the main lines of transportation, traveling had been difficult, since horseback riding was not suitable for pleasure trips. For a holiday jaunt to Passaic Falls in 1797, for example, William Dunlap and his friends hired two carriages. Although they apparently were quite alone on their trip, they met many "merrymakers' wagons, full of rustic beaux and belles" who, hardly interested in "nature" were crowding into public houses.³⁷ But only great people owned carriages; stages were ridden only when they had to be, since they were uncomfortable and roads—even the national roads—were in hideous shape. With the opening of the Erie Canal in 1827, traveling began to be thought of as a pleasure. Canal boats, moving four miles an hour and offering fair sleeping and dining facilities, made trips which were called the "Grand Tour," up through New York State to Lake Ontario, where passengers could visit Niagara Falls conveniently. What a thrilling experience it must have been to sail through the new and thriving cities of Utica, Palmyra, and Rochester—and just outside town to enjoy "unbroken wildness"! In his essays and novels published after the early 'thirties, N. P. Willis, the fashionable chronicler of his day, described how tourists swarming around Lake George and along the St. Lawrence were eager to discover the "unhackneyed" beauties of silent lakes and vast forests. Theodore Dwight was thankful indeed that "our canals often introduce us to the hearts of the forests; the retreats of wild animals are almost exposed to our view." But even though "our scenery, history and biography attract more attention than they once did," many are brought up unfit to enjoy them and "despite those who frequent our wild scenes and select the beauties of nature."³⁸

The romance of travel was being discovered by a steadily increasing throng. Sarah J. Hale, the publisher of *Godey's Magazine*, felt that "cir-

cumstances had almost inevitably designed us as a nation of travellers," though she felt that many travelers who could be sensitive to natural beauties did not yet take to touring the country for lack of intellectual and poetical associations with the scenery.³⁹ The constantly increasing love of the out-of-doors caused many city dwellers who could afford it to take up summer residence in suburbs or even in the country and along the Hudson and Schuylkill. Some inconvenience was caused by the less fortunate who could make only Sunday trips to enjoy a country picnic and who, unmindful of the owners, would swarm ruthlessly across the well-tended lawns of country estates. It was a common sight to behold traveling groups visiting revival meetings, or going out for picnics and camping, as may be seen in Henry Inman's painting, *Picnic in the Catskills* (about 1840; Brooklyn Museum). The larger the crowd, the more everybody enjoyed it. Frequently such mass entertainment centered around sporting societies, which had been known since the middle of the eighteenth century. In Philadelphia, for example, there was the "Fishing Company" (founded in 1732), made up of both sexes, which organized excursions on the Schuylkill and to the country in winter as well as in summer. In New York, Fanny Kemble, when she was entertained by the "Pacific Society" enjoyed walks through the woods with magnificent views across The Narrows. The widely read *American Farmer* recognized the value of outdoor recreation for "liberalizing the mind and invigorating the constitution," and frequently published articles and poetry to encourage it.⁴⁰

May Day was one of the occasions when "hundreds of the refined citizens of Boston . . . witness the glorious spectacle of a rising sun . . . pedaneous excursions are planned and parties made up."⁴¹ A typical meeting place for such outings was "Harmony Grove," near Framingham, Massachusetts, where citizens could enjoy "a day of pleasant recreation among wood land and lake scenery."⁴² It boasted a natural amphitheater, cricket grounds, and all "superior accommodations to parties." The grounds were easily accessible by the Framingham Branch Railroad. Paintings by W. J. Stillman (*Camp of the Adirondacks Club*, 1857; Concord Free Public Library), and Worthington Whittredge (*Camp Meeting*, 1874; Metropolitan Museum, New York), have recorded such meetings and their gay holiday spirit.

With the expansion of railroads in the 'thirties, traveling in some respects was made easier than in the heyday of the canal boats. *Davison*, the standard traveling guide for the Atlantic states, many times reprinted between 1822 and 1840, informs us that "the recent and gigantic internal

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improvements in the northern and middle states, and the development of new and highly interesting natural scenery, together with the increased facilities for travelling," greatly augmented the number of tourists who undertook "what has been usually denominated the Fashionable or Northern Tour."⁴³ Although trains, with their speed of two and three miles an hour, did not travel any more rapidly than canal boats, such distant regions as the White Mountains now became more easily accessible, though even in 1857 a trip to such a rugged area was thought of only as "being well for young lovers and romantic fools," but as for "old gentlemen, they should stay in their comfortable town house."⁴⁴ If the White Mountains were considered impossible for ordinary tourists, one can imagine that places beyond the Alleghenies were even less accessible.

The vanguard of tourists to the West was formed by artists, and John Banvard was one of the pioneers. He had traveled down the whole course of the Mississippi in 1840 and had painted scenes along the banks of the river on a canvas of enormous length especially woven for him at Lowell. Later, turning his flatboat into a show boat and floating down the Wabash, he exhibited his panorama to four thousand paying visitors—an audience which at this date was probably interested primarily in beholding the American scene in a comfortable manner. Other artists managed to go west by traveling with surveying parties. Albert Bierstadt went along with General F. W. Landers' expedition which mapped the railroad route across the Platte River and through Wyoming to the Pacific. Bierstadt, on his return, was the first to show the East a representative picture of the Rocky Mountains. When in 1857 he made his first trip to California, he became greatly interested in the Pacific Coast and was one of the first to show paintings of Sierra scenery in the Eastern cities. In time it became apparent that artists were an ever-increasing power in advertising the regions which were newly opened to the public. Recognizing this, the Baltimore and Ohio got some elegant publicity for its "picturesque" route along the Potomac and the Monongahela into West Virginia when, in 1857, the railroad invited twenty artists and photographers to enjoy the facilities of a special train which was fitted out with a kitchen car, dining saloon with piano, and a car "for photo purposes." To top it all the train would stop wherever the artists wished to make sketches or take photographs.⁴⁵

But the West beyond the Rockies was not yet accessible to such leisurely travel. We may conclude, however, that the attitude toward nature had changed enough since colonial days to allow Americans to welcome easier access to the West when it should come.

III. ORIGIN OF THE PARK IDEA

Neither the poet's love of nature and the artist's interest in its esthetic qualities, nor improvements in transportation and the citizen's demand for recreational facilities need have produced the scenic park. But if these forces did not produce it, did the park movement, then, originate in Congress?

This could hardly have been expected, for as long as the idea of protecting public lands against usurpation was not urgent or even recognized, the idea of a public park would have seemed utterly futile to the representatives. If Congress did not even acknowledge any duty to further the fine arts with the taxpayers' money, why should it feel justified in spending money on public lands to be withheld from "proper" use? Even some years after the Yellowstone Act had been approved in 1872, many in Congress expressed concern about this new "asset." To them it would have been better to have sold the area as other public lands had been sold. After all was it not "a very expensive luxury?" The Federal Government was not supposed to go into "show business" nor was it supposed to "raise wild animals." With such objections on record we may be rather sure that the park idea did not originate in Congress. Curiously enough, even Frederick Law Olmsted, when he tried to discover the origin of public parks in this country, had to give up—in all likelihood because he had been too close to the problem all his life. He said only that it did not seem to come as the direct "result of any of the great inventions or discoveries of the country," but that it probably had been "a spontaneous movement of that sort which we conveniently refer to as the 'genius of civilization'."⁴⁶ This may be; but Olmsted seems not to have considered that type of public park to which most men go eventually.

It remains unknown whether Dr. Jacob Bigelow (1786-1879), of Boston, who became aware of the "impolicy of burials under churches or in churchyards approximating closely to the abodes of the living,"⁴⁷ made such observations because he had studied the immense European literature on the subject, or because, as an enlightened hygienist and a public-minded citizen, he was alarmed by the potential danger of the usual burying places' "sad, neglected state exposed to every sort of intrusion, with scarcely any tree to shelter their barrenness."⁴⁸ He waged a war to do away with the old customs and called a meeting in November, 1825, to advocate the establishing of a cemetery outside the town. Among his friends were such influential people as Joseph Story, John Lowell, Edward Everett, and Daniel Webster. While it took five years to put the plan into effect, a useful preliminary step was the founding of the Massa-

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chusetts Horticultural Society in 1829. The members of this society merged with the sympathizers of the rural cemetery, suitable grounds were found at Mount Auburn, and on September 24, 1831, the first scenic cemetery was consecrated. Situated four miles from Boston, Mount Auburn was "the first example in modern times of so large a tract of ground being selected for the processes of landscape gardening to prepare for the reception of the dead."⁴⁹

In the founding of Mount Auburn a chord was struck which was destined to be heard throughout the country. In his consecratory address Judge Joseph Story spoke of how touched he was by the "solemn calm, as if we were in the bosom of a wilderness . . . a spectacle well fit to excite in us a noble emulation." How far the *Père Lachaise* in Paris, with its beautiful situation, may have served as an example to Boston, it is difficult to say. It is a fact, however, that a year after Dr. Bigelow initiated his movement, the *Atlantic Souvenir* of 1826 published an article in which an American visitor to the *Père Lachaise* described his impressions of this vast sanctuary, which presented "the appearance of a wide and variegated garden . . . where trees and shrubs conceal and disclose wild romantic beauty, tombs and temples."⁵⁰ An English traveler visiting Mount Auburn in 1833 remarked that it was laid out in imitation of the *Père Lachaise*.⁵¹ To a certain degree this was true, but there was at least one clear difference. The *Père Lachaise* was an old, established park and had been adapted to a new purpose. Mount Auburn was a spot considered to be of natural beauty and it was the intention to keep it that way and to "conserve" it. It was thought then that the necessary changes, such as the appropriate placing of monuments, would not destroy the idea of conservation, but on the contrary, would enhance the area's natural beauty.

The English traveler added that "parties of pleasure come hither from the city in great numbers every day at the rate of six hundred visitors on some days."⁵² Fanny Kemble also mentions that Mount Auburn was a favorite trysting place⁵³ and Theodore Dwight even suggested that cemeteries should be planned "with reference to the living as well as the dead, and therefore should be convenient and pleasant to visitors."⁵⁴ The founding of scenic cemeteries at New Haven (1833), New York (1836), Philadelphia (1836), and in many other places shows that the new idea was being rapidly accepted.

To a limited degree there had been "public" parks in this country since the beginning of colonization. When Penn laid out the original plan of Philadelphia he assigned for public use a number of squares, the largest

of which had measured ten acres. These were to be graced with trees and not to be built over, except perhaps with a few public buildings. Likewise there were "commons" such as those in England in most of the New England settlements. Primarily intended to serve as pastures, they were also used as parade grounds or for recreational purposes. But how little effort was spent to protect such lands from encroachment was evident in Washington, where L'Enfant's grandiose plan providing for an elaborate park system was abandoned very early and only taken up again seriously in 1909 when the original plan was resurrected.

While all these city-bound areas of minor scale cannot be regarded as nuclei for the later park development, the natural burial grounds outside the cities, with their great numbers of visitors who were not mourners, must definitely be regarded as steps in the direction of conservation and the beginning of the park movement. It seems a logical sequence that we should find that William Cullen Bryant was the first to advocate a public park in New York, a park that would be on a scale which up to that time had been unheard of. Although Bryant had discussed the subject privately as early as 1836, his first public plea was published in the *New York Evening Post* on July 3, 1844. While there is no evidence that Bryant was influenced by the scenic cemetery movement, the author of "Thanatopsis," "The Burial," "A Forest Hymn," and "An Indian at the Burial Place of His Father," must have been deeply impressed by the rural cemeteries developing throughout the country. Bryant was joined in his efforts by Andrew Jackson Downing, the landscape architect. In his *Horticulturist* of 1849, Downing asked, "If thirty thousand persons visit a cemetery in a single season, would not a large public garden be especially a matter of curious investigation?"⁵⁵ Downing had traveled extensively abroad, and among the parks he had seen when he visited England, France, and Germany, he mentions as particularly beautiful the so-called "English Park" in Munich. Curiously enough, the establishment of this huge city park was due to an American Tory, Benjamin Thompson (later Count Rumford), who had taken up residence in Munich.

With such eloquent advocates as Bryant and Downing behind it, the proposal for a public park in New York was well accepted, and in 1851 the first act was passed authorizing the acquisition of the necessary lands. The appointment of Frederick Law Olmsted as a superintendent of the project initiated a new era in the best possible way. Olmsted had been a friend and pupil of Downing and had also garnered experience in Europe. After some years of fruitful work in establishing the park, Olmsted dis-

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agreed with the Park authorities. He gave up his position in May, 1863, and accepted another as superintendent of the mining estates of General Fremont, in Mariposa. In the light of Yosemite's later role, this shifting of Olmsted's position from New York to Mariposa must be regarded as a most fortunate coincidence.

IV. THE IDEA GROWS

Even after the first excitement over the California Gold Rush had died down, the East learned little about the beauty spots of the newly acquired territory of California. None but the hardest traveler, and certainly no "tourists," would have been willing to stand the overland trek or either of the wearisome routes by sea. It is significant that one of the first big news stories to come out of California that was not concerned with gold was a show-business stunt. In 1852 the Calaveras Grove of Big Trees was discovered. The next year, two unscrupulous businessmen, George Gale and a companion, stripped one of the Big Trees, the "Mother of the Forest," 315 feet in height and 61 feet in circumference, up to the height of 116 feet, and shipped the bark East for a show in some of the seaboard cities, and then at the Crystal Palace exhibition in Sydenham, London, in 1854. The pamphlet sold in London boasted that the possibility of seeing a forest of such gigantic size would fully repay the toil of a journey to California. The show turned out to be unsuccessful since, "owing to the immensity of the circumference, nobody would believe that the bark had come from one tree, and finally, being branded as a humbug, the exhibition had to be ended."⁵⁶ While this was going on in London, the widely read *Gleason's Pictorial* published a protest by a Californian to whom it seemed a "cruel idea, a perfect desecration to cut down such a splendid tree . . . in Europe such a natural production would have been cherished and protected by law; but in this money-making-go-ahead community, thirty or forty thousand dollars are paid for it and the purchaser chops it down and ships it off for a shilling show. We hope that no one will conceive the idea of purchasing Niagara Falls for the same purpose."⁵⁷ The complainant went on to praise the beauty of the tree when it was still "a single sight worth a pilgrimage to see." Another strong protest was raised in 1857 by James Russell Lowell, who became editor of the *Atlantic Monthly* in the same year. His article on "Humanity to Trees" proposed to establish a society for the prevention of cruelty to trees, since "we are wanton in the destruction of trees as we are barbarous in our treatment of them."⁵⁸ In the next year, it was pointed out in *Harper's Weekly* that the big tree was now fast decaying, having been peeled "with as much

neatness and industry as a troupe of jackals would display in clearing the bones of a dead lion."⁵⁹ In the same year the Autocrat of the Breakfast Table published his book, in which Holmes included a "Talk on Trees" therein professing his passionate fondness for them. However trifling the incident may seem to us now, it aroused a great deal of sentiment in the East, and caused people to ponder their duty of protecting nature against the vandalism of enterprising businessmen. At the same time it undoubtedly stimulated great interest in the wonders of California.

The great event in California discoveries, *i.e.*, the opening up of the Yosemite,⁶⁰ was publicized with much less fanfare than the Calaveras tree murder. The account in the *Daily Alta California* about the scenic wonders of the valley discovered by the punitive expeditionary force of 1851 against the "Yosemitos" Indians created no stir outside the state. An article published in the *Mariposa Gazette* of July 12, 1855, by James M. Hutchings, whose activities from then on were to be dedicated to the valley, was of broader interest. Real recognition in the East came in 1856, when the *Country Gentleman*⁶¹ republished an article by the *California Christian Advocate* which declared the "Yo-hem-i-ty" valley to be "the most striking natural wonder on the Pacific" and predicted that it would ultimately become a place of great resort. Hutchings started his *California Magazine* in the same year and gave Yosemite good publicity in it. In 1855 and 1856 a California pioneer artist, Thomas A. Ayres, made his first sketches at the valley; some of these were lithographed and spread widely over the East. By 1856 Yosemite had become so well known throughout the nation that T. Richardson who published the first illustrated hand book of American travel of general importance,⁶² dedicated about 125 words and one illustration of Mirror Lake to the now celebrated valley of the Yosemite. Here the scenery was called "perhaps the most remarkable in the United States, and perhaps in the world." With such nation-wide publicity the fame of Yosemite was bound to grow year by year.

As one might have expected, Horace Greeley⁶³ paid his respects to Yosemite as soon as possible and made the most of it. For reasons unknown, Greeley was in a tremendous hurry and did more horseback riding in the valley than was good for him, especially since he was riding "in torture" with Mexican stirrups that were too small. Being badly disposed, he was disgruntled at the lack of water in Yosemite Falls (it was August) and said so, which afterward caused a furious dispute. But he could not help being overwhelmed by the "grandeur and sublimity of the wonderous chasm"; he considered Yosemite the "greatest marvel of the continent,"

and hoped that the State of California would immediately provide for the safety of the Mariposa Grove of Big Trees.

In view of the difficulties of transportation, making photographs in Yosemite was, of course, a major event in the early days. It was done for the first time in 1859 when C. L. Weed and R. H. Vance took photographs and also prepared stereoscopic slides. Their photos were on exhibition at the Fifth Annual Fair of the State Agricultural Society (May 21, 1859) in Sacramento and there earned great applause. At the same time *Ballou's Pictorial Drawing Room Companion*⁶⁴ published an illustrated article about Yosemite regretting that it was neither sufficiently known nor appreciated, a criticism not quite justified inasmuch as travel to the West was quite difficult and would remain so for some years to come.

The first really thorough description of the experience of an extended Yosemite trip appeared in a series of eight articles, which Starr King sent to the *Boston Evening Transcript* from December 1, 1860, to February 9, 1861.⁶⁵ Starr King, of course, was an expert in writing such accounts and had published *White Mountains* shortly before. His much-regretted transfer from Boston to San Francisco at least gave him a chance to explore the West and recount his adventures to the eagerly waiting friends at home. As his friend H. W. Bellows later wrote in an obituary on Starr King,⁶⁶ "no one had really seen the Sierra Nevada, Mount Shasta, the Yosemite Valley . . . until his fine eye saw and his cunning brain and hand depicted them . . . you will find the newspapers in which his portraitures of these sublime and charming scenes are found carefully laid away in hundreds of New England homes as permanent sources of delight." His papers, entirely forgotten today, acquainted the East better than anything else with the fabulous beauties of Yosemite.

The most important photographic records following Weed's were by C. E. Watkins (1863), which Oliver Wendell Holmes compared with the finest work done in Europe.⁶⁷ They were constantly on exhibition at Goupil's art galleries in New York.

With so much interest devoted to Yosemite by travelers, journalists, and writers from the East, it would be fascinating to know who in California was taking active interest in the destiny of the valley. We unfortunately know only very little about this. Certainly Starr King's enthusiasm made him one of the leaders in the effort to conserve Yosemite, and it was well known that he was planning a book about the Sierra and Yosemite which would have been a sequel to his *White Mountains* book. Given his love of nature, his position as one of the most prominent and influential citizens of California made him the natural leader in the campaign.

Among his friends was Judge Stephen Field, who had visualized the need of having the state make a geological survey. Owing to Field's effort, Josiah Dwight Whitney had been appointed to carry it out, assisted by William H. Brewer and Clarence King. F. L. Olmsted's papers⁶⁸ show that immediately after his arrival in California, in September, 1863, he became enthusiastic about the valley and tried to work for its conservation. But Whitney, though not his assistants, disliked this activity and tried to obstruct it.

The men who were recommended as the first commissioners of the Yosemite grant are most likely those who helped to prepare the act. They were Professor John F. Morse, Israel Ward Raymond, and Frederick Law Olmsted. Of Morse we know only that he was a well-thought-of physician in San Francisco. About Raymond we are better informed. It was he who addressed the decisive letter to Senator John Conness urging him to present a bill concerning Yosemite to Congress. Raymond was the California representative of the Central American Steamship Transit Company of New York. He was known to have been a public-spirited citizen, and certainly did not take this step to further any of his business interests. Altogether, it is quite safe to assume that as a whole the group of men promoting the interests of Yosemite did so for idealistic reasons. This is demonstrated in the measures they recommended and pushed.

The coincidence of Olmsted's arrival in California at the very moment when he was most needed has curiously enough never been noticed. For once it seems that the right man was in the right spot at the right time. Living in Mariposa, Olmsted was in close touch with Yosemite, and, we can be certain, thoroughly familiar with its problems. Certainly no one was better prepared to take an active part in urging the Yosemite grant and to keep the ball rolling. Preliminary discussions must have taken place, probably with Olmsted and the other potential commissioners, before Raymond addressed the following heretofore unpublished letter to Senator Conness:⁶⁹

88 Wall Street
New York, 20th February 1864.

Hon. John Conness
Washington
Dear Sir:

I send by Express some views of the Yosemite Valley to give you some idea of its character. No. 1 is taken from a point on the Mariposa trail and gives a view of about seven miles of the Valley, and the principal part of it. You can see that its sides are abrupt precipices ranging from 2500 feet to 5000 feet high. Indeed there is no access to it but by trails over the debris deposited by the crumbling of the walls.

The summits are mostly bare Granite Rocks in some parts the surface is covered only by pine trees and can never be of much value.

It will be many years before it is worth while for the government to survey these mountains. But I think it important to obtain the proprietorship soon, to prevent occupation and especially to preserve the trees in the valley from destruction and that it may be accepted by the legislation at its present session and laws passed to give the Commissioners power to take control and begin to consider and lay out their plans for the gradual improvement of the properties.

May not this be a sufficient description:

"That cleft or Gorge in the granite peak of the Sierra Nevada Mountains situated in the County of Mariposa, State of California, on the head waters of the Merced River and known as the Yo Semite Valley with its branches or spurs in length fifteen miles and in width one mile back from the main edge of the precipice on each side of the valley the lines to be defined on Sectional lines when surveyed, by the Surveyor General of the United States and in the spirit of this act."

I take this length and width to secure the approaches from any annoyance. The south end is narrow and filled by the Merced River. The North end leads to Mono, is narrow and filled with rocks, and impassable to a mule.

"Also all those quarter sections in Mariposa County on which stands the grove of Gigantic trees known as the 'Mariposa Big Trees' not exceeding in all Four Sections of one mile square each, the lines to be defined in the spirit of this act by the Surveyor General of the United States when surveying the said County of Mariposa."

I say "quarter" section because the trees are too scattered to be covered by four square miles in compact.

If thought best to have a compact tract it should require six or eight sections.

"The above are granted for public use, resort and recreation and are inalienable forever but leases may be granted for portions not to exceed ten years. All income derived from leases or privileges are to be expended in the preservation and improvement of the prospectus or the roads leading thereto."

The properties shall be managed by (5.7.9) commissioners who shall not receive any payment for said services. Vacancies for death, removal, or resignation shall be filled by the others subject to confirmation by the State Senate. The first Coms. to be:

The Governor of the State of California, Ex. off.

The Collector of the Port of San Francisco.

Prof. Whitney—State Geologist.

Fred Law Olmsted of Mariposa.

George W. Coulter of Coultersville.

[Added by Conness in space left by writer:]

The Mayor of the City of San Francisco.

Prof. John F. Morse do.

I. W. Raymond do.

Full reports to be made annually to the Senate of the State.

If we can obtain this grant, I believe we can get Subscriptions in California to make improvements. Submitting the above,

I am very truly yours,

(Sgd.) I. W. RAYMOND.

Conness sent this letter to the Commissioner of the General Land Office, accompanying it by the following letter of transmittal:

Washington
March 6, 1864

Hon. J. W. Edmonds

Dear Sir:

Herewith you will find a letter with a description of the land of the Mariposa Big Trees and Yosemite.

Will you have the kindness to prepare a bill and send it to the committee of the Senate or to myself. You might insert in this the springs in a separate section. Leave blanks for the names as commissioners or insert as you find them or insert as I have Prof. John F. Morse, I. W. Raymond, Stephen J. Field. This will make nine commissioners. Let the grant be inalienable, and in regard to the mineral springs take care to insert a provision which shall not confirm any state land warrant or state location made in pursuance of any land of the State of California.

Yours truly,

(Sgd.) JOHN CONNESS.

The General Land Office furnished the requested data promptly so that Conness was able to introduce the bill on March 28, 1864. There was some discussion on the floor of the Senate in which Conness stated that the bill had come to him from various gentlemen in California "of fortune, of taste and of refinement," that the General Land Office also took great interest in the bill, and that there was "no other condition of things like this one on earth." Finally he referred to the sorry incident of the killing of the Calaveras tree in 1853. The bill was passed, and on June 29, 1864, it was signed by President Lincoln.

So far nothing was extraordinary about the Yosemite grant, and national public opinion certainly was not aroused by the federal action; grants to states were given quite frequently. However, there was something peculiar about this grant, and as it happened, it was destined to set a precedent of real importance. The grant was given "upon the express conditions that the premises shall be held for public use, resort and recreation, shall be held inalienable for all time." These terms implied that no profit was to be expected from the new institution. Probably it was assumed that at least all costs of upkeep would be offset by revenue from leases or privileges; at any rate, Congress took no responsibility. What was really new about the grant was the fact that it served a strictly nonutilitarian purpose. It is necessary to stress this point in view of the claims that Yellowstone set this precedent.

On September 28, 1864, Governor F. F. Low of California proclaimed the grant to California and made known the Commissioners he had appointed: Frederick Law Olmsted, J. D. Whitney, William Ashburner,

I. W. Raymond, E. S. Holden, Alexander Deering, George W. Coulter, and Galen Clark. Olmsted became chairman and immediately took the lead in the effort to organize the protected area. At the same time he ordered a survey made and a map drawn by Clarence King. Since Olmsted needed this as soon as possible as a basis for the suggestions he planned to make, he magnanimously paid all expenses himself, with no more than a hope that he might be reimbursed by the California legislature two years later. All through 1865 Olmsted was hard at work preparing a plan of management. In a letter to his father (July 5) he expressed his feeling that Yosemite was "far the noblest park or pleasure ground in the world." Just at this time he received the first group of dignitaries from the East who wished to visit the park. They were Schuyler Colfax, Speaker of the House, and a group of friends from the East and from San Francisco. Among them were Samuel Bowler, publisher of the *Springfield Republican*, who had been interested in the Yosemite campaign; Charles Allen, Attorney General of Massachusetts; and Albert Richardson, the distinguished war correspondent of the *New York Tribune*. Altogether there were seventeen gentlemen and three ladies. The Easterners were proud that they had come across the plains, "simply to see the country and to study its resources." In the travel account published later, Bowles made this remarkable statement:

"The wise cession and dedication [of Yosemite] by Congress and proposed improvement by California . . . furnishes an admirable example for other objects of natural curiosity and popular interest all over the Union. New York should preserve for popular use both Niagara Falls and its neighborhood, and a generous section of the famous Adirondacks, and Maine, one of her lakes and its surrounding woods."⁷⁰

Here we have in unmistakable language a formula not just for the protection of this or that area of interest to some group or other, but for a systematic approach to an over-all system of protection of areas which illustrate specific features of nature throughout the nation. That is exactly the pattern which was followed many years later after the National Park Service had been established. It is well to note that Bowles made his statement in connection with Yosemite, which he must have considered as the first step in the direction he advised the country to take. Bowles's counsel undoubtedly represented the opinion of the distinguished group of men of which he was a member. The fact that Bowles felt that state legislatures should protect the areas is not important in evaluating his plan. One could hardly expect anyone in 1864 to envisage federal legislation for the purpose of conserving state areas. The way Yosemite had been handled made it quite evident that in spite of the fact that the grant

was made to the state, the object of the grant was considered to be of nation-wide if not of world-wide importance.

Confirmed in his actions by Colfax and his party, Olmsted happily continued his efforts to organize the park. All his suggestions for improvements were summed up in a report approved by the Yosemite committee and submitted by him to the legislature. Unfortunately this report is lost and cannot be traced in the papers of the legislature in Sacramento. We can, however, get a glimpse of the thoughts which directed Olmsted in preparing his report by means of a questionnaire he addressed to three artists:

Yosemite
August 8th, 1865

Messrs. Williams, Hill and Watkins.
Gentlemen:

I address you in behalf of the Commissioners appointed under the Act of Congress, establishing Yo Semite and Mariposa Grove as a ground for recreation. The action of Congress with regard to the Yo Semite was doubtless taken in view of the peculiar value of its natural scenery, the purpose of its action was to give the public for all future time the greatest practicable advantage of that scenery, and the duty of the Commission is to secure the accomplishment of that purpose. What effects natural scenery favorably or unfavorably to the enjoyment of mankind is the principal study of your lives and as you are at present making a special study of the scenery of the Yo Semite you may find it convenient to give some thought incidentally to two general questions your advise upon which would be of great service to the Commission:

1st. Are there any conditions affecting the scenery of the Yo Semite unfavorably which it would be in the power of the State to remove, or the further and increased effect of which might be prevented?

2nd. What can be done by the State to enhance the enjoyment now afforded by the scenery of the Yo Semite?

The Commission being required by act of Congress to perform its own duties gratuitously and no provision having been made for meeting any expenses in the premises, I cannot promise the pecuniary remuneration for your advice which it would be your right to demand, but it is hoped that the importance of the Commission's duty as a field of study for artists and the great interests of the public in having the action by the State well advised present sufficient grounds of apology for requesting your professional assistance as a favor.

I am, Gentlemen, very respectfully

Your obt. servant

FRED LAW OLMSTED
First Commissioner

Apparently the artists had been commissioned to make a special study of the scenery of the park and the way it might be improved. Virgil Williams (1830-1886), from Massachusetts, had studied in England and came out West in 1862; C. E. Watkins was the photographer mentioned

previously; and Thomas Hill (1828-1908), who had studied in Paris, had been living in San Francisco since 1861. Because one of Hill's Yosemite paintings on exhibition in Boston in 1868 had been acclaimed as the best representation of the great natural wonder of California, it was chromolithographed by S. Prang in Boston and became widely known all over the country. Olmsted's letter is interesting in several respects: first, it shows how eager Olmsted was to get the expert opinions of artists; secondly, it confirms Yosemite's nation-wide importance; and finally, it shows again the lofty attitude of Olmsted, who expected everybody to work as he did without regard to remuneration. Unfortunately Olmsted could not wait to see his recommendations carried out; soon after his report was dispatched to Sacramento he accepted the appointment as landscape architect for Central Park and returned East in November, 1865.

After 1865 the Yosemite grant was developed normally; the occasional difficulties which arose were chiefly caused by the early settlers in the park who were unwilling to give up certain claims. The fame of Yosemite grew. At the World Exhibition in Paris in 1867 an international audience became acquainted with Yosemite through twenty-eight photographs by Watkins as well as through three hundred stereoscopic views. Copyrighted in 1863, portfolios with lithographs of California, including Yosemite, were published by Edward Vischer in 1870. In 1868 the first carefully prepared guidebook of Yosemite was produced by John S. Hittell, with twenty photos by "Helios," pseudonym for Edward J. Muybridge, the first motion picture photographer.⁷¹

The year 1868 brought John Muir to California. His profound devotion to the Sierra initiated a new era in spreading the glory of Yosemite. His enthusiasm is well epitomized in his letter inviting Emerson to Yosemite. "I invite you to join me in a month's worship with Nature in the high temples of the great Sierra Crown beyond our holy Yosemite. It will cost you nothing save the time and very little of that, for you will be mostly in Eternity."⁷² In spite of his age, the sixty-seven year old Emerson accepted the invitation and braved the hardships of a journey to Yosemite. In May, 1871, he arrived in the valley. This is what he jotted down in his journal as his first impression: "In Yosemite, grandeur of these mountains perhaps unmatched in the globe; for here they strip themselves like athletes for exhibition and stand perpendicular granite walls, showing their entire height, and wearing a liberty cap of snow on the head."⁷³

With Yosemite ranking so high in national favor, the propagators of

projects for other scenic areas of some importance were busy trying to get them nationally recognized and protected. There were, of course, many such areas of more or less doubtful value, and their evaluation and recognition took its due course. One of the major areas was that of Niagara Falls. Claims had been made in 1835 that the falls were "the property of civilized mankind." Since 1850 the legislature of New York was lobbied in favor of a bill to protect the falls "against waste and degradation." Once more Olmsted was among those who supported protective legislation. This was finally passed in 1883.

The Yellowstone case had been settled more than a decade earlier by the act of March 1, 1872, which created Yellowstone National Park as the first area under federal protection, exclusive of Hot Springs, Arkansas, the establishment of which was a history of its own. Much has been made of the belief that Yellowstone was the first federal park. One has become quite accustomed to reading statements that the establishment of Yellowstone "was the first step of any consequence taken to protect our natural resources, and from it our entire conservation program has grown."⁷⁴ In another report we are told that the idea of the national park system was launched at that now historic campfire on Sept. 19, 1870.⁷⁵ We read it again in a brief history of the National Park Service published in 1940 as a Government publication by the Department of the Interior.

All these statements are based on Hiram M. Chittenden's presentation of the events which led to the establishment of Yellowstone.⁷⁶ Louis C. Cramton has refuted this story completely and says that the early explorer "David E. Folsom's suggestion to General Henry D. Washburn (in August 1870) was the first recorded idea of a reservation of the Yellowstone area for public benefit . . . the Hedges proposal at the campfire put in train of action the movement to secure such reservation."⁷⁷ Since the campfire story has already been discounted here, it is not necessary to discuss the consequence of giving up the sentimental legend. As we have seen, the "national park idea" has a very respectable pedigree and was anything but new in 1870. But there is one point made by Chittenden which deserves attention. It was mentioned earlier here that George Catlin was the first man in this country to conceive the idea of a national park. Chittenden in the first edition of his Yellowstone book⁷⁸ came to the same conclusion. Surprisingly enough he retracted this opinion in the second edition, maintaining that "Catlin's idea of a National Park was solely [aiming at] . . . a home for the Indians . . . his name cannot be considered in connection with those who originated the idea of the Yellowstone Park."⁷⁹ Undoubtedly Chittenden was correct in assuming that Catlin

had in mind some kind of a national park which would form a sort of Indian *Habitat*. But while such an idea would hardly detract from Catlin's original hope to conserve a portion of the American heritage for the public good, Chittenden apparently does not reason that way. It was only because Chittenden believed that Catlin had had the Yellowstone area in mind for his project that Chittenden asserted Catlin's priority for the idea, and after concluding that Catlin's suggestion had nothing to do with Yellowstone, Chittenden rejected Catlin as the originator of the general idea, as well as of the specific plan. From this it seems that Chittenden crystallized his thoughts solely around Yellowstone as *the* national park.

The same conception seems to have prevailed throughout the early debates of Congress concerning Yellowstone. It appears that creation of this one park was regarded as the supreme effort in this respect. A typical statement by Senator Vest may illustrate this attitude: "There should be to a nation that will have a hundred million or a hundred and fifty million of people a park like this as a great breathing place for the national lung, as a place to which every American citizen can resort."⁸⁰ Special attention is called to this point of view because it does not show the same clear vision of the needs of the whole country and the possibilities offered by an entire continent as does the program proposed by Samuel Bowles and quoted previously, which represented the idea of a group of distinguished men who had studied the situation in Yosemite. Public opinion as echoed by the *New York Tribune* appears to have tended toward Bowles's view. In a review of one of Nathaniel Langford's talks propagandizing Yellowstone, the paper says that "while we always have our Niagara and Yosemite this new field of wonder . . . should be at once set apart as a public national park."⁸¹ Apparently Yellowstone was here thought of just as one of the "natural attractions," to be set aside as Yosemite had been.

One more problem remains to be settled. That is, did the establishment of Yellowstone as a federal park advance the park idea more essentially than the earlier attempt to protect Yosemite? Of course there is no doubt that placing Yellowstone under federal administration represented a completely new departure and as such this event is certainly worthy of due recognition. Early in the nineteenth century, Congress almost unanimously would have resented such threats to taxpayers' money. But trends around 1870 were different, and it was no longer unheard of for Congress to pay attention to art, education, or similar, not quite tangible "values." Therefore, the establishment of a federal park was not exactly a stupendous deviation from undertakings directed by the *Zeitgeist* of that era.

In the long run federal protection of deserving areas did prove to be

the most satisfactory form of protection, and in this respect Yellowstone marks a certain beginning, but hardly a promising one, as beginnings are usually described. Buck as well as Cramton, in their studies concerning the early history of conservation and Yellowstone, have shown that those who urged the creation of the park were for the most part exponents of groups wishing to preserve the area for their own interests. Their lobbying, and not general public support, was influential in getting the bill adopted and we can well understand why the passing of the bill caused no "flurry either in Washington or in the country at large" . . . and "an attitude of indifference prevailed."⁸²

The same attitude continued for more than a decade of the so-called formative period of Yellowstone. Travel was light. The park was remote, there were hardly any lodgings and no roads, scarcely any guards or rangers were on hand to advise visitors and the superintendent was usually absent. Tourists could not, therefore, have been expected to use the new "pleasuring ground" in any large numbers. It does not seem strange that in the early years the park "administration," if this word is at all permissible, was ever close to collapse. More than once Congress was possessed with the urge to rid the federal administration of its incubus. After all, Congress had only been asked to protect Yellowstone because in 1870 it was in a territory and could only be taken care of under federal custody. To encourage Congress to adopt the bill, no appropriations were asked for, nor supposedly were they intended to be asked for in the next years. It could have been anticipated that such a situation would breed difficulties; but because of the lobby's pressure the bill passed and a trouble spot was created. Yellowstone had to muddle through its formative years rather desperately.

Yosemite, once it was set aside, progressed smoothly, contributing far more than Yellowstone, it would seem, toward advancing the idea of conservation. It makes little difference that one area was under custody of a state and the other of the federal government. Certainly the purpose to which Yellowstone was "dedicated and set apart as a public park or pleasuring ground for the benefit and enjoyment of the people" in 1872 did not differ from the purpose for which the Yosemite grant had eight years earlier been given in trust to the State of California, "upon the express condition that the premises shall be held for public use, resort and recreation . . . inalienable for all time." It should be remembered also that the attaching of stipulations to the California grant was no empty gesture. When it was reported in later years that the State of California was not doing so well as a trustee of the grant, a congressional investigating com-

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mittee inspected the park with the result that, with the consensus of all interested, it was resolved that the park be placed under federal management. These difficulties began to turn up in the 'nineties; Yosemite in its early years was favored by the gods. Appropriations for improvement were granted by the legislature of California as soon as necessary and possible. From the time on when the Central Pacific touched Stockton (1869), national tourist travel began to invade the valley. Yosemite was soon in a niche in the minds of the American people, who admired their country and took pride in it. Most people could not go out to California, but a chromo by Prang was within the reach of almost every lover of nature; the enormous editions of these lithographs, showing Yosemite, proved how eager people all over the nation were to satisfy their desire to become familiar with the wonderland of California.

Thus it seems certain that although Yellowstone was the first federal venture in the field of protecting areas, this fact alone did not advance the concept of conservation in the first decade and a half of the park's existence. Had it not been for a group of senators faithful to the cause, the House would gladly have yielded to those who wished to drop the project or sacrifice it to the interests of pressure groups who would have destroyed the purpose of the park. It is questionable if Congress, with the Yellowstone experience alone, would have considered extending the national park system. Quite significantly, when the system was extended in 1890, it was to protect areas around Yosemite as well as those now called Sequoia National Park and General Grant Grove—all of them in California, where the park idea had developed so well.

In the year of the Yosemite grant another milestone was passed in the publication of George P. Marsh's *Man and Nature*. This book, frequently reprinted until 1898, was the first to approach the theme of conservation in scholarly fashion. It was widely read and most influential; Bryant, for example, quoted it in his editorial on the "Utility of Trees" in the *Evening Post* of June 20, 1865. It is most likely that Marsh's ideas influenced those men who were responsible for the Yosemite grant even before he published them [in 1863 and 1864]. By the time the Yellowstone problem was being discussed, his thoughts had become common property. Marsh recognized how complex conservation problems are; in his chapter, *The Instability of American Life*, he wrote, "We have now felled forests enough everywhere, in many districts far too much. Let us restore this one element of material life to its normal proportions and devise for maintaining the permanence of its relations to the fields, the meadows and the pastures, to the rain and the dews of heaven . . ."⁸³ In a new edition of *Man and*

Nature he added these words to his chapter, *Forests of the United States*: "It is desirable that some large and easily accessible region of American soil should remain as far as possible in its primitive condition, at once a museum for the instruction of the students, a garden for the recreation of the lovers of nature, and an asylum where indigenous trees . . . plants . . . beasts may dwell and perpetuate their kind."⁸⁴ Though this was written shortly after the establishment of Yellowstone Park, it certainly must reflect thoughts that Marsh had developed much earlier.

As a logical consequence of these ideas, Theodore Roosevelt inaugurated the conservation program out of which the National Park Service grew. The idea the program represents is based on a series of trends—deeply rooted in the American pattern of life, developing in various strata, ranging over a long period of time—that were finally embodied in park, state, and federal initiative. The idea of keeping intact some of the grand scenery of the New World such as Chateaubriand had celebrated—

there is nothing of age in America but the woods . . . that is well worth monuments and ancestors—⁸⁵

was never quite lost sight of, from the day George Catlin conceived it until it matured in the protection of the jewel of all, "holy Yosemite." With this achieved, other successes were no longer difficult. One pearl after another was collected and strung with the others to form a national park system which is the unrivaled adornment of this hemisphere.

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Yosemite's Fatal Beauty

By WILLIAM E. COLBY

YOSEMITE, the incomparable, is "the grandest, most divine of all earthly dwelling places . . . the Lord's mountain house"—thus was it described by John Muir.

This extraordinary valley, with a level parklike floor seven miles long and averaging three-quarters of a mile in width, hemmed in by sculptured cliffs exceeding half a mile in height over which pour several of the grandest falls in the world, is a veritable Mecca for tourists. In 1870, when the total number of visitors for that year was 1735, Muir wrote his good friend Mrs. Ezra Carr asking when she would again visit the valley. She replied that she would come once more, but that it was getting so overcrowded that it would probably be her last visit. On May 29, 1870, he replied: ". . . you complain of the desecrating influences of the fashionable hordes about to visit here, and say that you mean to come only once more . . . I am pretty sure that you are wrong in saying and feeling so, for the tide of visitors will float slowly about the *bottom* of the Valley as a harmless scum collecting in hotel and saloon eddies, leaving the rocks and falls eloquent as ever and instinct with imperishable beauty and greatness; and recollect that the *top* of the Valley is more than half way to real heaven and the Lord has many mansions in the Sierra equal in power and glory to Yosemite, though not quite so open, and I venture to say that you will yet see the valley many times both in and out of the body."

Only twelve days earlier, he had written her, "There are about fifty visitors in the valley at present."

Just before World War II the annual travel figures at Yosemite had risen as high as half a million, and the maximum attendance in any one day, upwards of 25,000. I often wonder what Mrs. Carr would have said about this. I know from my long acquaintance with John Muir that his reply would have been the same as it was in 1870. With the right spirit, anyone can profit by a visit to this great mountain temple, despite the crowds. They stick to the beaten paths and it is not difficult, even on the floor of the valley, to find peace and solitude but a few steps away. There are many sequestered nooks where one will rarely hear a human voice or footstep. However, the mere presence of this mass of humanity does result

* Reprinted through the courtesy of *National Parks Magazine*. Mr. Colby has added several new paragraphs. In addition to serving forty-eight years as a Sierra Club Director, Mr. Colby has for seven years been a member of the Yosemite Advisory Board.—Ed.

in a serious impact on the restricted valley floor and gives rise to many complex problems.

First and foremost is the problem of the number of humans. Obviously a saturation point can be reached when all accommodations in the valley have been filled and all the allotted camping space occupied. This has occurred many times in the past, particularly over the 4th of July holiday. On such occasions those arriving in the valley without making reservations have been compelled to sleep in their cars because of lack of accommodations. Counting everyone, National Park Service personnel, employees and visitors, this saturation point is reached when there are 25,000 persons in the valley. At such times the congestion is nerve-racking. Dodging cars, the traffic noises, standing in line for meals, are not conducive to peaceful satisfaction. Visitors are of two classes, campers and those who patronize the Hotel Ahwahnee, Yosemite Lodge and Camp Curry.

Ever since the valley was discovered by the Savage-Bunnell party in 1851 it has been a paradise for campers. Their name is legion. No wonder, for the life of a camper under the whispering pines beside the Merced River in such glorious surroundings is the realization of a poet's dream. As a consequence, with the development of the San Joaquin Valley, the advent of the automobile and the improvement of roads leading to Yosemite, camping became so popular that restrictions were necessary. Camping is now limited to certain well defined areas in the upper or eastern part of the valley floor, mainly along the river. One of the wise limitations has been the reservation of a strip of river bank so that hikers may pass up and down the river without invading campsites. While campers now come from all parts of the United States, the summer heat in California's Central Valley causes numberless families to flock to the comparative cool of Yosemite and remain there through school vacations. However, as the congestion has increased it has become necessary to limit the stay of campers, particularly at peak periods. While there has been some complaint, the regulation is fair and it may even be necessary to shorten the stay still further in order to give as many as possible the privilege of living amid such sublimity.

A constant source of worry is the serious effect of wear and tear on the camp grounds. They are a sorry, dusty sight when the summer is over. Because of this, there is some attempt at rotation of use. Rotation was possible during the war when gas rationing limited travel, but will be difficult with the return of normal travel conditions. However, nature has a miraculous way of healing wounds of this sort, and, in the fifty years that I have known Yosemite intimately, I have seen each fall and winter,

with their rain of leaves and needles, restore much of the natural aspect of the camp grounds. No serious attempt has yet been made to limit the length of stay of visitors who patronize the hotel, lodge and camp (Camp Curry, where there are bungalows and tents with permanent wooden floors). Patrons are received in the order of priority of application and may stay indefinitely unless there is conflict with other prior commitments. As already noted, congestion at peak periods necessitates turning away and refusing to book many who wish to visit Yosemite. This is unfortunate, but the concessionnaire company cannot be expected to finance and furnish accommodations which would be used only during a brief peak period. If the desideratum is to give the greatest possible number of people an opportunity to enjoy this wonderspot, then the only feasible alternative is to limit the period of stay during peak attendance, as is done with campers.

This increasing demand of campers and tourists for accommodations on the valley floor at peak periods raises a most serious problem. The remarkable increase of population in California, and the resumption of normal travel, reflected by a constant upward curve, necessitates additional valley employees who in turn add to the total valley population. A study has been carried on for some time to determine the feasibility of removing from the floor of the valley to some near-by point outside the valley all dispensable activities and persons; but even this removal would only be a partial remedy and would not solve the major problem. Another suggestion is to induce the public to visit the valley at other seasons and thus utilize the accommodations more nearly up to capacity for longer periods. Unfortunately, the public is a stubborn entity and it is difficult to spread a demand which is motivated by school vacations that happen to coincide with the time when the valley is most appealing. Some work has been done along these lines, however, and more is possible, because fall and winter in Yosemite are seasons of great beauty. Another plan, tested for many years, is to induce campers to occupy camps in the higher country, such as Tuolumne Meadows, Lake Tenaya, Bridalveil Meadows, and Glacier Point. The difficulty is that these camp grounds, because of snow conditions, are seldom attractive early enough to relieve the major Yosemite travel peak in June and early July. These upper camp grounds afford a slight relief, but when the valley itself is what people come to see, it is not easy to persuade them that something else will do as well.

Those who have devoted much thought to the problem have suggested determining the optimum point, measured in numbers of visitors, at which the crowding becomes so great that the enjoyment of being in the valley

is materially diminished. This figure would represent the maximum number that would be allowed in the valley at one time. Presumably the optimum number would be somewhere between 20,000 and 30,000. I am not entirely convinced that the arbitrary fixing of such a maximum attendance figure is the best solution. If an optimum number had been decided upon in 1870, and if Mrs. Carr had been the arbiter to determine this number, it would probably not have exceeded a few hundred persons at one time, if that many. I am much impressed by John Muir's attitude which always was to induce as many people as possible to go into the mountains and get their good tidings. In this connection, Yosemite was foremost in his thoughts, because he felt convinced that no one could enter "God's grandest temple" without receiving spiritual benefit.

Another thought worth considering is that the crowding and shortage of adequate accommodations, with their attendant diminishing returns, act as deterrents and, each time in the past, the congestion has itself brought its own remedy. It must be admitted that this is a weak way of meeting a difficult problem, but, on the other hand, we have many examples of greater harm done when an arbitrary exercise of authority has proven to be a poor substitute for the natural operation of economic laws.

If we look far enough into the future we may well concede that it will be impossible to provide overnight accommodations for the increasing thousands who will wish to enjoy nature's outstanding wonderland. It may well be that when that day arrives, as someone has suggested, more overnight accommodations will be provided at various points outside of the existing park boundaries, and at frequent intervals noiseless trains of rubber-tired sightseeing cars will enter the valley, passing up one side and down the other, making frequent stops so that visitors will have freedom in walking about on the valley floor on designated paths and trails. Personally, I am glad that that day has not yet arrived, although I recognize it may be the ultimate solution born of necessity. There is an indefinable, but soul-satisfying charm in actually living in this grandest of all of nature's temples, to wander about under the magic influence of moonlight, which accentuates the height of the walls and makes the falls even more ethereal, and also to see the early morning light first flooding the crown of Half Dome, and then pouring down into and filling every nook and corner of the valley itself. It is the contemplation of these varying moods throughout all their subtle changes that brings the greatest enjoyment.

There is, however, a way in which valley conditions can be improved. The result would be to afford the opportunity for more who really love the valley for its best qualities to be there at peak periods. It would mean the

simultaneous elimination of those who go to the valley primarily to have a "good time" and who are little impressed or attracted by its noble qualities. I realize, when I suggest this, which at best will be only a partial remedy, that I am treading on dangerous ground. After all, where is there the Solomon wise enough to pass judgment in such elusive matters and decide that this person is qualified and should be permitted to visit the valley and that one not?

There is a means of accomplishing this in a natural way. It has, in a measure, been put into effect in the past. Additional beneficial results can be obtained in the future if the plan is further developed. That plan is to modify the type of entertainment furnished the guests. Some years ago the government granted a concession for furnishing overnight accommodations in Yosemite to a new company. Desirous of building up a paying business and recouping its large initial capital expenditure, it inaugurated various types of entertainment to attract visitors. Some of these were good, while others were not in keeping with the surroundings. The underlying idea was to attract as many visitors as possible to the valley by supplying forms of amusement that would appeal to the many. The thought that the only people who should be encouraged to come to the valley were those who would appreciate the valley itself was not a controlling factor, nor did any one anticipate that travel would become so great as to congest accommodations. Subsequently, this company merged with the earlier existing Camp Curry company, and the combination has carried on as a single enterprise. The same desire to attract patrons, irrespective of whether they come to enjoy the outstanding natural scene, persists, although the company management has recognized the validity of criticism and has taken steps accordingly to modify the entertainment.

The National Park Service has done much and can do more to help bring this about. The government's nature guide and interpretive service, as well as its conduct of the museum are, in my opinion, the best influences we have in Yosemite. The work should be encouraged. Everyone who visits the valley and is in tune with the spirit of the place desires to learn more about it. Its human history, its geological history, the life of its animals and birds, trees and flowers, all have tremendous appeal to such persons. The National Park Service has done much along these lines, but is hampered by lack of sufficient appropriations. The Service can help serve the entertainment problem by making its splendid campfire programs available to more visitors, non-campers as well as campers. It has been suggested that the campfire program be moved to a more centrally located spot providing accommodations for a larger audience. It would

seem that much could be accomplished by so doing, and the proposal will doubtless receive sympathetic consideration. All this will help to screen out and discourage from coming to the valley persons who visit it primarily for social contact and amusement, and to whom the beauty of the valley is secondary or nonessential. Talks on nature, the history of the discovery of the valley, the outstanding men whose names have been identified with it, moving pictures of scenic travels and winter sports, and good music, would all be in keeping with the spirit of the place, while "jazz" and "ballyhoo" are not. Dancing comes closer to the borderline. Personally, I do not object to it in moderation. The concession company conducts the dance programs in a satisfactory way as far as hours and supervision are concerned. It is popular with the younger set, but no one can gainsay the fact that the periodic blares and blasts of syncopation that are wont to rend the air at intervals are disturbing to light sleepers in near-by quarters. There is a growing demand for winter sports in Yosemite National Park. Badger Pass, situated close to the valley at a height sufficient to insure good snow conditions, is already a famous winter sport area. Skiing is a healthful sport and its enjoyment results in little or no permanent injury to the landscape. To ski in those sublime surroundings is an experience long to be remembered. The National Park Service is wise, however, in discouraging the holding of large public competitive meets that necessarily are surrounded by an atmosphere more consistent with those at resorts, but out of place where the primary thought is to preserve the peace and dignity of the scene. Publicized competition would attract crowds with many attending such meets who would care little for park values and whose presence would prevent park enthusiasts from visiting the park at such times.

A question of concern in all national parks, especially Yosemite Valley, is the predicted growth of travel by air. Pressure has been and will be brought to make the parks easily accessible by air. It is unthinkable that any portion of the precious floor of the valley should be sacrificed to a landing field. The noise and reverberations from the cliffs would introduce an element utterly out of harmony. The danger of fickle air currents in such a confined area would be great. The solution is to have an airfield reasonably near the valley beyond the edge of the park, from which passengers would be whisked into it by bus. This should satisfy anyone, and would avoid desecrating the temple itself.

While each year's impact of half a million or more visitors on the valley floor tends to mar its wilderness values, there are other factors at work which in all fairness must be recognized in order that we may have a true

picture of what is taking place. When I first entered the valley via the Big Oak Flat road on a heavenly Sunday morning in July of 1894, I experienced one of the most exalted emotional reactions of my entire life. All that I had read in descriptive praise of the valley's incomparable features did not adequately prepare me for the reality. It is true that when we started to camp on the edge of Bridalveil Meadow the mosquito hordes resident there caused us hastily to move on up the valley to a higher and more congenial camping spot. Even this temporary aggravation did not seriously interfere with our mood of reverent worship. Today careful government control has largely eliminated the mosquito nuisance.

In 1894 the valley floor was very unkempt in comparison with its present-day appearance. Pack and saddle stock ranged everywhere and the best meadows were fenced either for pasturage or for crops of hay for the stock. Travel on the roads produced clouds of dust which gave the near-by vegetation a drab appearance. The Stoneman House which stood out in the open in front of what is now Camp Curry was a great white structure utterly out of place in such majestic surroundings. Snow's hotel, La Casa Nevada, stood prominently on the ridge squarely in front of Nevada Fall. With the passage of time these and other blots on the landscape have disappeared with scarcely any traces left to mark their previous existence. Modern roads have solved the dust nuisance which in those days took much of the joy out of travel. The unsightly fences have been removed and the meadows permitted to return to a state of wildness. Taken as a whole, the natural scene in Yosemite is far finer and more inspiring even with the thousands who visit the valley today than it was when I first saw it in the early 'nineties.

There is one element that civilization has introduced into Yosemite which merits comment. Before the white man arrived the Indians annually burned off the grass and brush on the floor of the valley for a double purpose—to increase the meadow areas and make better grazing for the deer and also to eliminate as far as possible the thicket growth which otherwise would afford cover for an approaching enemy band of Indians. This resulted in an open parklike floor where men on horseback could ride from one end of the valley to the other without having to pass through any dense and concealing growth. This open parklike condition was to some extent continued after white men took over the valley as a result of considerable cultivation of level ground and pasturing of stock, which roamed at will over most of the valley floor and browsed on the brush and discouraged young tree growth. In the past fifty years, however, a complete transformation has taken place. Fires are now controlled so that they do little

or no damage, and grazing of stock is forbidden. As a consequence, tree seedlings in countless thousands and thick growths of brush have taken root; dense and almost impenetrable thickets are the result. A careful survey by Mr. Emil F. Ernst, Park Forester, and comparison of early-day with recent photographs, establishes the fact that there is now only one-half the open meadow area on the floor of the valley that once existed. Uncontrolled forest growth may be desirable in appropriate places but in Yosemite we need open vistas across meadowland in order to get the full effect of the majestic cliffs and falls. Already many of the favorite old-time views, such as those so splendidly photographed by Professor J. N. LeConte, are completely closed off by dense tree growth, and as one drives into the valley today the roads on either side of the valley that once commanded a succession of open views of great magnificence are now largely forest aisles with only an occasional outlook. As great a tree lover and conservationist as John Muir recognized the seriousness of this problem nearly forty years ago. The Sierra Club has in its possession a document in his own handwriting addressed to the Secretary of the Interior shortly after the recession of Yosemite Valley, in which Muir played such an important part, which contains the recommendation "that a general plan for the treatment of the floor of Yosemite Valley be made by a competent landscape artist and carried out under his supervision. *This would include the thinning and clearing of undergrowth jungles*; the building of a permanent system of roads located with reference to the scenery, aesthetic effects, etc., instead of the present haphazard dust sand and mud ruts called roads and the restoration of the downtrodden herbaceous vegetation to something like the beauty of wildness . . ."

The Yosemite Advisory Board has also urged that clearing be done so as to restore certain outstanding views, and the National Park Service, proceeding with great caution, has carried out some of these recommendations with results that have been highly praised.



Moraines with Ice Cores in the Sierra Nevada

By FRANÇOIS E. MATTES

GLACIAL MORAINES are not always what they seem to be. Particularly deceptive are the massive morainal embankments that encircle the fronts of some of the glaciers in the Sierra Nevada. They *look* like genuine moraines composed entirely of glacier-borne rock debris, yet several of them, it has recently been discovered, consist actually of masses of stagnant, or so-called "dead" glacier ice covered by a thin layer of moraine.

Typical examples are the apparently solid moraine ridges that wall in the terminal lobes of the East Lyell, Maclure, and Conness glaciers. A fourth was discovered last summer by Dr. C. W. Sharsmith at the front of the Koip Glacier; he describes it in an article in *Yosemite Nature Notes* (March, 1948). Doubtless many more will be found in the High Sierra if search is made for them. Several morainal embankments that have attracted attention by reason of their great bulk as compared with that of the small glaciers behind them already are on the "suspect" list and deserve to be examined closely when favorable conditions present themselves. Among them are notably those of the Dana and Palisade glaciers and of the two glaciers on Mount Darwin.

It was while laboriously climbing the huge embankment at the front of the lesser of the two Darwin glaciers, in 1927, that I first got a hunch that a bulky mass of this sort might contain a core of old glacier ice preserved beneath an insulating layer of rock debris. The ascent proved unexpectedly troublesome because many of the boulders were unstable and provided very insecure footing. Some of them toppled or slid at the first touch, and about half-way up, in spite of my precautions, I started a rock slide, which I evaded with difficulty. But that slide was not wholly without benefit to me, for it left a scar in the slope, and in that scar I beheld ice.

My thoughts flew back to the summer of 1910, when I clambered wearily over the chaotic moraine-covered end of the South Tahoma Glacier on Mount Rainier. I was making the topographic map of the peak, and it was necessary to ascertain where the line should be drawn between the moving ice of the glacier and the "dead" ice beyond it. No definable line of demarcation could be found. But those vast masses of stagnant and partly stagnant ice had irregular, pitted surfaces. This moraine at the front of the lesser Darwin Glacier had a well-defined crest line and a steep back slope. Is it possible, I asked myself, that a ridge shaped like a typical terminal moraine could be a debris-covered mass of "dead" ice?

More light was shed on the problem in 1931, when Park Naturalist C. A. Harwell undertook to mark the positions of the ice fronts of the glaciers in Yosemite National Park, in preparation for annual measurements of the recession of those ice fronts. He could find no ice *fronts*, properly speaking. The surface of each glacier sloped down and disappeared under the terminal moraine, and the moraine itself had scars in its sides that revealed ice. But whether that ice was old glacier ice or merely névé left from the previous winter in protected places remained an open question.

In 1939, however, nature furnished the answer in an astonishing, dramatic way. According to the report of J. E. Cole, then Assistant Park Naturalist, a deep lake of melt water had been formed at the foot of the Conness Glacier and immediately behind its great terminal moraine. The water rose gradually until it reached the level of a saddle in the embankment. Pouring over, it quickly eroded and melted a narrow slot with vertical sides across the ridge, thereby revealing the latter to consist of glacier ice mantled with rock debris. A photograph taken by Cole from the glacier shows the channel trenching across the ridge as neatly as if it had been cut with a Cyclopean knife.

Dr. Sharsmith's discovery at the front of the Koip Glacier is equally convincing. The melt water there did not trench across the embankment, but flowed in a stream along its inner base and undercut the back slope. The mantling debris then slid off, leaving the ice core exposed to a height of about thirty feet. The ice was found to have all the characteristics of true glacier ice. These successive revelations leave little doubt that many other embankments at the fronts of Sierra glaciers, which heretofore have been regarded as ordinary terminal moraines, are really debris-covered ice masses.

However, moraines with ice cores, it should be understood, are not a specialty of the Sierra Nevada, but occur elsewhere also. Oliver Kehrlein some years ago found extensive masses of debris-mantled glacier ice on the flanks of Mount Shasta, and Professor Charles Laurence Baker, of the Agricultural and Mechanical College of Texas, recently discovered a typical moraine with ice core on the Wind River Range of Wyoming. The glaciers on that range, though on an average somewhat larger than those on the Sierra Nevada, are in fact of precisely the same type, and many of them are hemmed in by massive morainal embankments.

These curious debris-covered ridges of "dead" ice that closely simulate ordinary moraines have as yet received but scant attention from glaciologists, and nothing definite can be announced either about their age or

about the processes whereby they are formed. But it seems appropriate here to offer a few reflections on these subjects, in the hope that they will stimulate research in the years to come.

It is desirable, in the first place, to start out with some perspective on recent glacier history. As has been set forth elsewhere,* it is now reasonably certain that the present glaciers in the Sierra Nevada are not remnants of the great ice streams of the glacial epoch, as was formerly supposed, but products of a much more recent cool period which, for want of a suitable technical term, I have provisionally called *the little ice age of historic time*. That moderately cool period, which still continues, began presumably between 3000 and 4000 years ago, when the excessively warm middle part of the postglacial interval—*the climatic optimum*, as the paleo-ecologists have termed it—came to an end. There is thus no possibility that the moraines with ice cores in the Sierra Nevada date from the great ice age, which terminated, according to the now generally accepted Swedish chronology, about 9000 years ago.

However, neither is there reason to believe that any of the moraines with ice cores are 4000 or 3000 years old, for, like the comparable “modern” moraines in Europe, they were formed by the culminating glacier advances of the little ice age, and these, it is definitely known from documentary records preserved in the Alps, in Norway, and in Iceland, occurred in those countries during the 16th, 17th, 18th, and 19th centuries. A succession of extraordinary and even catastrophic glacier advances took place during those four centuries. The last one reached its climax towards the year 1850. We, in the United States, possess no similar store of documentary records telling of glacier advances that took place three or four centuries ago, but it may reasonably be assumed, on climatologic grounds alone, that on our western mountains the culminating phases of the little ice age occurred at approximately the same time as in Europe. The climatic ups and downs that gave rise to the strong glacier oscillations recorded in Europe could not have been mere local fluctuations but must have been of world-wide extent. It follows, then, that the age of our moraines with ice cores narrows down to the last 400, or possibly 500 years.

Incidentally, it deserves to be stressed that, although we have in this country no documentary records of past glacier advances, we do possess natural records which, if studied intensively, would very probably give us the approximate dates of those advances. Those records are contained in

* Reports of the Committee on Glaciers, in *Trans. Amer. Geophys. Union*, 1939, pp. 518-520; 1940, pp. 398-403; 1942, pp. 377-384. Chapter V, Glaciers, in *Hydrology, Physics of the Earth series*, No. 9, (McGraw-Hill), 1942, pp. 212-214.

the rings of growth of the trees that stand on the successive moraine ridges. Such studies, it is true, are not likely to be successful in the Sierra Nevada, because the moraines of the little ice age there lie all, or nearly all, above timberline; but in the Pacific Northwest where stunted timberline trees reach far up on the modern moraines, such studies may yield worthwhile results. Systematic studies of the rings in such trees have, in fact, already been begun on Mount Hood. They are being conducted by Dr. Donald B. Lawrence, of the Department of Botany at the University of Minnesota, under the auspices of the Research Committee of the Mazamas.

In the Sierra Nevada, as on Mount Hood and our other glaciated peaks, "modern" moraines form a distinct group produced evidently by a series of glacier advances that occurred at short intervals. In some places, as at the front of the Kuna Glacier and the west lobe of the Palisade Glacier, they form closely spaced concentric ridges, but elsewhere, as at the front of the East Lyell Glacier and the main lobe of the Palisade Glacier, they are jammed together in one massive embankment. Every one of the morainal embankments which I have visited in the High Sierra is a compound mass made up of several moraines shoved against or plastered over one another. This fact is indicated by their multiple crests. The embankment of the main lobe of the Palisade Glacier, for instance, has two prominent crests and a lesser intermediate crest, and the masses of material of which they are the ridge lines were contributed by three successive glacier advances. It is evident, further, that these three masses lie superimposed upon a large and rather formless body of older moraines.

The question naturally arises, whether there is a core of ice in each of the component parts of the embankment. Weldon Heald recognized the possibility of it, and on his excellent map of the Palisade Glacier showed the buried ice as being presumably coextensive with the entire moraine system.* Future investigations may, indeed, prove that he is right.

Two features in any event strongly suggest, if not prove, that ice cores exist in the younger parts of the embankment. These are (1) the shallow pond which usually forms in summer on the surface of the glacier near the inner base of the embankment, and (2) the broad sag in the crests of the embankment in the vicinity of the outflowing streamlets of melt water.

The pond has a bottom of glacier ice and in all probability is also rimmed by ice in or under the embankment, for the morainal rubble, which contains no clay in this part of the Sierra Nevada, can hardly be watertight, whereas glacier ice is definitely known to be impervious where

* Palisade Glacier Survey, Sierra Nevada: *Amer. Alp. Jour.*, 6:3 (1947), pp. 333 and 336.

not crevassed. Similar ponds, or lakelets, occur on the lower ends of a number of Sierra glaciers, directly behind the moraine. It was the water that had accumulated to unusual depth behind the embankment of the Conness Glacier, in 1939, which cut the slotlike passage across the embankment already mentioned.

The sag in the embankment of the Palisade Glacier I am inclined to ascribe to the settling of that part of the mass as the result of the collapse of a stream channel in underlying ice. When I passed through the sag in 1938, it contained several large boulders that showed unmistakable evidence of having been overturned very recently. Only an irregular and rather sudden settling of the ground under them seemed to me an adequate cause for their being toppled over.

In this connection it seems appropriate to mention that in 1935, when Park Naturalist C. A. Harwell and his assistants arrived at the lower end of the Maclure Glacier in order to measure its recession since the preceding year, they discovered to their astonishment that since their visit in 1934 a large moraine-covered area together with the lower margin of the glacier had caved in. And a bouldery ridge which they previously had taken for a moraine deposited on the toe of the glacier proved to be, itself, a mass of ice at least 30 feet high and only thinly mantled with rock debris. That "cave-in" clearly was caused by the collapse of a large stream channel under the ice. There is reason to believe that such "cave-ins" are of frequent occurrence at the moraine-covered lower ends of our Sierra glaciers.

Another morainal embankment that would probably repay close investigation is the one at the front of the Dana Glacier. The main reason is that both the glacier and the embankment have been photographed at different times as far back as 1883, and there are thus considerable data for a comparative study of their conditions at intervals during a period of 65 years. Like the embankment of the Palisade Glacier, that of the Dana Glacier appears to be composed of three distinct masses of material superimposed upon one another and giving rise to three crests, and beneath these relatively recent additions to its bulk there is a formless body of older moraine. Shallow ponds of water also commonly lie directly behind the embankment, and very probably indicate the presence of an impervious ice core under the morainal debris. But of greatest interest is the fact that the photograph which Professor Israel C. Russell took in 1883 shows that the embankment then already had its three crests and was shaped very much as it is now. Evidently the last of the three additions had been made prior to 1883. In what year it was made is purely a matter

of conjecture, but a very reasonable guess would be that it was about the year 1850, which was the time of the last major glacier advance in the European Alps. If that surmise should prove to be right, the ice core concealed in the last addition to the embankment would now be around one hundred years old. And if the preceding additions also contain ice, some of that ice might be as much as two hundred years old. Shall we ever be able to do better than to make such guesses?

There still remains the question, why and how have the Sierra glaciers produced moraines with ice cores? By what manner of process, and under what special conditions have these large masses of ice become incorporated in the moraines, to remain preserved for centuries? That the overlying rock debris acts as an effective insulating covering is self-evident, but how is that covering, which does not extend over the rest of the glacier, to be accounted for?

The explanation that is usually given for the well-known fact that many fairly clean glaciers become heavily mantled with rock debris in their terminal portions, is that because melting proceeds with increasing rapidity toward the lower altitudes, more of the rock debris that is carried within the ice—the *englacial moraine*—is liberated at the surface of the terminus of a glacier than in its higher portions and in the course of time forms a "concentrate" that shields the terminal portion from the heat of the sun and the air.

But that explanation is not altogether satisfactory, for, in the case of the Sierra glaciers it fails to account for the fact that the middle portions of those glaciers, which have been reduced 30 to 50 feet below the crests of the morainal embankments, still have comparatively clean surfaces. If the explanation were sound, those parts of the glaciers that have been most severely reduced in thickness by surface ablation (melting, evaporation, etc.) should be the most thickly mantled with debris. One can only conclude that there is some other process at work within those glaciers that tends to produce a concentration of debris on their terminal portions. What manner of process can this be?

Here we must draw upon the results of recent researches in the mechanics of glacier motion that are not yet widely known, though accepted by most glaciologists. These researches have demonstrated that a mountain glacier gravitates downslope primarily by plastic flow, somewhat like a highly viscous substance such as tar. Flowing down through a channel-like valley or canyon, therefore, a glacier is in truth an *ice stream*, and is very appropriately so termed.

However, a glacier is not equally plastic in all its parts. The plasticity of glacier ice is induced by pressure and increases from the surface down nearly to the basal layers (which are charged with rock debris, the so-called *ground moraine*). At the surface and for some distance below it the ice has so little plasticity that it behaves largely as a brittle substance and cracks under tension as it is carried along by the smoothly flowing lower layers, which bend but do not break over abrupt steps in the rock bed. Crevasses in our latitudes rarely exceed 100 feet in depth and so afford an approximate measure of the thickness of the brittle upper crust. (In the frigid Arctic and Antarctic regions crevasses are much deeper.)

It follows from all this that on our mountains an ice mass must attain, in general, a thickness of more than 100 feet in order that it may develop plastic flowage in its lower layers and assume the characteristics of a true glacier. (The minimum depth required varies, of course, inversely as the angle of slope and is affected also by the roughness of the bed.) It also follows that under like conditions a deep glacier will have greater mobility and will flow faster than a shallow one.

Now consider the movements that will take place in the middle and terminal portions of a cirque glacier such as is shown in longitudinal section in figure 1. With the movements at the head of the glacier, which are very complex, we are not concerned. In order to make the case as simple as possible, the middle section, from A to B, has been given a uniform thickness throughout, and the bed under it has been given a uniform slope. The flow movement between A and B therefore will proceed with the same velocity throughout. But beyond B the thickness of the ice begins to decrease as the result of increasing ablation. At the same time the slope of the bed begins to flatten, and so two factors begin to retard the flow movement. The pressure on the lower layers is reduced and the pull of gravity is lessened. As a consequence the thick and rapidly flowing ice of the middle section, upon reaching B finds its path obstructed by somewhat slower-moving ice. And the latter upon reaching C in turn is obstructed by still more sluggish ice. Thence on to the terminus obstruction will become worse and worse and the movement will be more and more slowed down.

Wherever the flow of a glacier meets with obstruction, the more rapidly moving ice will crowd up, and literally shove up on the slower ice in front of it. As a result, inclined shear planes such as are indicated in figure 1 will develop. In the plastic lower ice these are of the nature of "blue bands" in which the ice crystals are reformed and enlarged by the differential movement. But in the brittle upper ice thrust planes will develop and

measurable overthrusting movements take place. Such overthrusting has actually been observed by scientists in both Europe and North America.

In a glacier well over 100 feet thick the thrust planes will die out downward in the plastic lower ice; but in the terminal portion, where the thickness finally diminishes to less than the critical 100 feet, the thrust planes will reach all the way down to the ground moraine. With each jerkwise overthrusting movement some of the ground moraine will be lifted from the bottom, and then little by little will be carried up along the thrust plane until it finally reaches the surface of the glacier, where it will be added to the debris released by ablation. Thus, through the combined action of the two processes, but probably chiefly through the upthrusting of ground moraine, the terminal portion of the glacier becomes cloaked with debris.

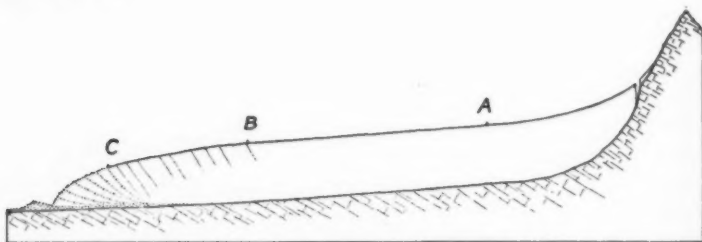


Figure 1. Longitudinal section of a cirque glacier at time of advance. The terminus overrides older moraines, and some of this material is being shoved up to the surface along inclined thrust planes in the ice.

Thrusting naturally is particularly active when the glacier, swelled to great thickness by abundant snow supply, is rapidly advancing, for the sluggish terminus then is literally being shoved forward. But the thrusting undoubtedly reaches a climax when during such an advance the terminus meets with morainal deposits left in its path by a previous advance. Unable to push such obstructions bodily out of its way, the glacier then thrusts the terminus over them. When this happens large quantities of debris become incorporated in the base of the terminus and are carried upward to its surface along the inclined thrust planes. It is chiefly under such conditions that the debris mantle becomes thick enough to act as an insulating covering.

When, as the result of lessened snow supply or mounting summer temperatures, or both combined, the glacier ceases to advance and enters upon a period of gradual depletion, its clean middle section (between A and B, in figure 1) will be most rapidly reduced in thickness, while the debris-

mantled terminus remains standing hardly changed in height. As the clean ice melts down to lower and lower levels, the back slope of the residual mass grows steeper and steeper, debris sliding off and exposing some of the buried ice to melting temperatures, and so, in the course of time, what was once the terminus of the glacier gradually assumes the form of a sharp-crested moraine ridge (figure 2).

In the Sierra Nevada two circumstances appear to have operated to concentrate much debris on the embankments with ice cores and at the same time to keep the glaciers behind the embankments relatively clean. These circumstances are: (1) the accumulation of rock debris in the empty cirques during the long period that intervened between the great

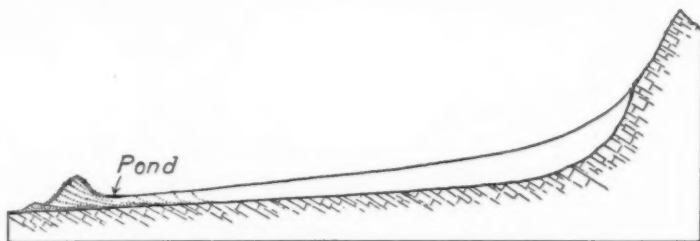


Figure 2. The same glacier in a depleted state. The main body is greatly reduced in thickness; but the debris-covered terminal portion remains standing in the form of a moraine with an ice core.

ice age and the little ice age, and (2) the almost complete removal of that accumulated debris by the modern glaciers, resulting in fairly clean rock floors.

It is to be borne in mind that the present Sierra glaciers did not come into existence until 6,000 years or more after the end of the glacial epoch. Throughout those 6,000 years the walls of the empty cirques were subject to frequently recurring frost action, and as a result large quantities of rock debris accumulated in the cirques. The newly formed glaciers, it follows, must at first have been heavily burdened with ground moraine. This they dragged with them and dumped at their fronts, thus creating the voluminous but rather formless older moraines noted. Then the later glacier advances came and thrust their terminal ice masses together with enveloping debris up on the older moraines, thus creating the multiple crests of the compound embankments.

As for the second circumstance, there is reason to believe that all, or nearly all, of the rock debris that had accumulated in the empty cirques

before the advent of the modern glaciers was swept out by them during their earlier advances. The cirque floors consequently are now fairly clean and the glaciers carry but little ground moraine in their upper and middle courses. Therefore, although some thrusting must have developed in those sections of the glaciers as they became reduced in thickness, but very little rock debris has been thrust up to their surfaces.

Such is my tentative and somewhat hesitant interpretation of the manner in which the morainal embankments with ice cores in the Sierra Nevada have been produced. Clearly much scrutinizing study remains to be done before we can claim to understand their mode of origin fully. To those who love to ramble about in the High Sierra it may, however, prove a fascinating task.

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Surveying California's Ski Terrain

BY DAVID R. BROWER AND RICHARD H. FELTER

IN THE COURSE of the campaign to save the San Gorgonio Primitive Area it became necessary to point out that there was in California much ski terrain not in wilderness and not yet developed for skiing at all, or at best not adequately developed. It was apparent that those who would protect the wilderness needed positive arguments. Merely to say to winter sportsmen, "No ski lifts here," was not enough. The best defense would be to point out to skiers where, outside the wilderness areas, they could have their ski lifts. The ideal defense would be to point out where else they could ski better and on finer ski terrain than any in the wilderness they coveted.

So the good question during the campaign remained, "Where, within close enough range of skiers who want to develop San Gorgonio, is there better skiing, development of which skier-conservationists can approve and advocate?" Various answers to this question were proposed at the San Bernardino public hearing as well as in direct correspondence with the Forest Service. But for the most part the answers could not be based entirely on facts. Opinion had to flow more freely, simply because all the facts weren't in then, and aren't in yet.

The concept that wilderness was worth holding for its own sake, with or without perfect legal arguments to support it, won on San Gorgonio, with reasonable concession having been given skiers by moderate revision of the boundary to exclude an area already developed and to provide easier access to those who wanted to ski on the mountain in its wild state. The resulting lull in demand for reclassification of the area now affords skiing conservationists the time to complete a study of California ski terrain initiated before the San Gorgonio campaign and given impetus during the battle. In the Sierra Club the task of gathering the facts has been accepted by the Winter Sports Committee and assigned to a subcommittee that is conducting a ski terrain survey.

Much of the work of the subcommittee has been collative. Much factual study had already been carried out, and its results are to be had for the asking. The California Ski Association has long been studying the subject. The National Park Service, vitally concerned with the need for reconciling skiers' demands with national park concepts, has its own files of information. Cordtland Hill, of Los Angeles, with ski experts Hannes Schneider and Luggi Foeger, made a semiphotographic aerial survey of

the Cascades and the Sierras Nevada and Madre, which they followed up with an on-the-ground investigation of the most promising areas, and a report entitled, *Ski Area Survey of California and Parts of Nevada and Oregon* ([Los Angeles] 1946). This report appeared shortly before the San Geronio hearing, and its editorial balance seems to lean a little toward San Geronio, but it is nevertheless a remarkable survey for "the limited time available." The report is the only one in print, except for a running narrative of ski-terrain possibilities appearing in *The Sierra Nevada: The Range of Light* (reviewed elsewhere in these pages).

One more study that has been carried on, and the most important of all, is that made by James N. Gibson, of the California Region of the Forest Service. He has had the job—an enviable one to most other skiers—of getting out on skis in as many as possible of California's national forest areas that are adaptable to ski development, and he has had the job for several years. Moreover, he accompanied Foeger, Hill, and Schneider in many of their travels, and shared in the making of their observations. If one man were to be named as the outstanding expert on California ski terrain, it would surely be Gibson. He is a member of the Sierra Club, and quickly and graciously consented to put his findings at the subcommittee's disposal.

The subcommittee has reciprocated as best it could, considering that its survey proper has been under way for barely more than a year. The subcommittee has, however, been able to collect new data of its own, largely through the efforts of Lowell Sumner, of the Region Four office of the National Park Service, and also a Sierra Club member. Sumner is a man who can fly his own plane and shoot photographs out of the window while dodging thunderheads, at the same time knowing exactly where he is on the map. Then he precisely identifies the terrain shown in the dozens of photographs he makes in a single flight. This he has done for the subcommittee.

The subcommittee has gone into its survey, admittedly, with a few predilections about areas and development. These are listed here, not necessarily in order of importance:

1. California has at present no ski development which may be considered first-rate, or Class A, the fact that the Sierra Nevada has the greatest recorded snowfall in the United States notwithstanding.
2. The Class B developments—the best that now exist—are all situated at or below the lower boundary (the red fir belt) of the skiing zone.
3. The Class B type of development will take care of most of the state's skiers so far as their abilities or week-end demands are concerned,

but there should be more of this type of development *in the skiing zone*.

4. There is too much development that could be described as uncoordinated Class C or lower, typified by a jerrybuilt "lodge," a 200-foot uphill slash in the forest adjacent to the highway, and an unsafe rope tow in the slash (or on a sagebrush slope if there is no forest).

5. Class C development disfigures too much terrain per man day of skiing use, and is customarily shoestring financed. It is the marginal sort of enterprise that folds with the first dark days of vanishing boom, leaving disfigurement behind it that only Americans seem to tolerate in their mountain scene.

6. There are no adequate hut-touring facilities, all development plans to date having too preponderantly favored downhill-only skiing. Although hut-touring will never enjoy in quantitative measure the popularity of packed slope skiing, an adequate hut and trail system is essential to the well-rounded development of skiing. A reasonable demand for touring will exist when that system is made attractive—an accomplishment that will require (a) the laying out of circle or triangle tours that start, run, and finish in alluring ski terrain; (b) the building of huts that are an easily traveled distance apart; (c) the signing of routes between huts; (d) the provision of an adequate subsidy for the foregoing steps; and (e) the development of touring leadership.

7. Future ski development should be directed toward the Class A and Class B types in conjunction with hut and trail systems.

8. For financial and conservational reasons, future development should be superposed on areas already developed for summer use and serviced by highways that (a) *can* be cleared of snow and (b) *will* be cleared because they are important for other users than skiers. Then the subsidy of snow clearance need not be charged solely to skiing. Skiing is entitled to a subsidy, just as other recreational uses of public lands are; but it is the obligation of skiers to plan their developments where the subsidies of snow clearing, ski-trail clearing, housing, etc., can bring the sport to a maximum number of persons. Skiing is also entitled to the decreased costs that are made possible by year-round resort operation—a benefit that will inhere in summer recreation as well, but will never materialize unless summer and winter uses are coordinated and combined.

9. The purposes for which national parks and wilderness areas have been set aside should not be jeopardized until the possibilities for more efficient use of areas presently developed and accessible have been exhausted. Those possibilities have hardly been touched.

10. Interest in skiing, a semiluxury sport, is not necessarily going to

rise in future decades at the same rate as in the last decade. The ski business, like any other, can be overcapitalized.

Full consideration of these criteria cannot help but put California skiing on a sounder basis than it now is. They can resolve the differences between those who go to mountains solely to ski and those who go there solely for wildness—and still leave plenty of room for both mountain-user minorities in a country that consists of minorities (*e.g.*, skiers are a minority of the population) and evolves laws to protect them.

These criteria cannot be intelligently applied, however, until a lot more is learned about our ski terrain than we now know. Each category of mountain recreationists, and each administrative agency that has considered the terrain and its recreational use, has so far been primarily concerned—perhaps too primarily—with its own immediate problems. There is a national need, in which we are interested, for a survey group, perhaps jointly appointed by the National Forest Service and National Park Service, in which multiple-users and multiple-use administrators can get together and talk out their differences. There is a California need, with which we must be concerned, for the same manner of survey. Perhaps the Sierra Club, whose membership includes representatives of all interests, is best suited to make the comprehensive survey and draw up recommendations based on it. At any rate, the Sierra Club is now conducting what can at least be considered an interim survey.

Any ski-terrain survey that is intended to safeguard country which is of great value for its wilderness qualities must anticipate the needs of the promoters of winter sports: it must accumulate the data that can persuade the promoters to look elsewhere. To be of real help in evaluating, with respect to the possibilities for ski development in nonwilderness areas, the survey must assemble the answers to these questions about each of those areas:

1. Is the area adaptable to year-round use?
2. Is it already accessible by road, developed for summer use, and near enough to centers of population?
3. Is winter access economically feasible? That is, is it on a highway and is there parking space that can be cleared of snow and is likely to be; or must oversnow access be contemplated? Is access by air, rail, or bus feasible?
4. Is it in the skiing zone: high enough to be assured adequate snowfall and reasonably open slopes for a long enough season? What is the effect of the prevailing wind on skiing? Is it reasonably avalanche free?
5. Is the terrain of the proper scope? For example, in a Class A devel-

opment the altitude range of skiable snow served by lift should be between 2,000 and 3,000 feet, with enough variety of slope exposure to assure a good snow surface somewhere within the range, if not throughout it, on any given day, and enough variety of slope gradient to accommodate advanced, intermediate, and novice skiers, there being as well a means of segregating the skiers according to their abilities. A Class B development can fall short on all these criteria and still satisfy most local skiers, but will hardly draw winter sports enthusiasts from other states.

6. Are sites available for the additional accommodations that will be necessary for winter use, and is it feasible to winterize existing facilities? Can the area be zoned so that there will be a minimum of friction between summer and winter uses?

7. Is there an outlying area in which a touring hut and trail system can be developed?

8. What provision can be made, for spectators as well as participants, for all forms of ski competition?

9. Should the development be planned to accommodate maximum week-end crowds, or should it be on a scale best suited to less intense but steadier use by winter vacationists?

10. If the area is in a national park, will the development that is contemplated be compatible with the purposes of a national park?

It is not likely that any area will be found anywhere that will be ideal in all the qualities sought by these questions, but they will at least permit us to weigh advantages and disadvantages of one area against another. Nor is it likely that all these questions can be answered for any one area without a careful on-the-ground study by experts. A ski-terrain survey need not supply all the answers, however; in fact, it should not, lest it bog down in a mass of details. The immediate needs of the Sierra Club survey can be met by:

1. Collation and interpretation of data already available from previous surveys. This is being done now.

2. Submission of reports by ski tourers and ski mountaineers, who, in going beyond the limits of the areas now developed, can be on the lookout for suitable new areas. This is something that those undertaking the survey would like all skiers to do who have an understanding of the needs of a development.

3. Continuation of the air photo-topographic map coverage already initiated.

This last is more properly the first step, since an adequate interpretation of good air photos supplemented by accurate maps can preclude a

great deal of waste effort on the ground. Oblique air photos can prove most informative, not only for those looking for ski-development sites, but also for skiers who would like to plan a safe but interesting ski-mountaineering itinerary in the back country.

As a first step in obtaining a coordinated overview of currently interesting areas, the series of air photos made by Lowell Sumner has been planned so as to give a basis of comparison over much of the state. It is hoped that they may show a few good sections which have not yet been recognized as being of value. Against this basis of comparison, more detailed data will be added as obtained or whenever a need for specific information arises. The present studies are being made only on the fringe of the high country represented by a strip about ten miles from present cleared roads or railroads and no more than about a mile from existing summer roads.

In preparation for the taking of the photographs, topographic maps were meticulously examined and areas which seemed promising were marked for the photographer. Views were taken at a distance of about four miles to assure as wide coverage as possible and still give enough detail with the single focal-length lens used. About 200 pictures were taken within a two-week period in April and May, 1947. At that time the amount of snow was less than normal, being roughly equivalent to that found in mid-May of a normal year. Although the snow normally outlasts the skier's interest in skiing in any year, the photographs were taken this late because the characteristics of the snow deposit are most clearly shown as the snow begins to leave the ground. Storms and lack of time prevented the inclusion of some important areas in the first year, and it is planned to complete the survey this year—which will fortunately serve as a basis for comparing two seasons.

Ten representative photographs are presented on the facing page and following pages to suggest the type of information to be gained from the aerial survey. The intention of the subcommittee making the survey is to continue to add to its collection of descriptive data, and to make the resultant compendium available for general reference. Members of the subcommittee—Richard H. Felter (chairman), David R. Brower, Lewis F. Clark, Alex Hildebrand, Charlotte E. Mauk, and Gordon Stimson—will welcome communications from all persons who can provide additional information on promising winter-sports areas.

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Ten Ski Terrain Airphotos

Late April-early May, 1947—season's end in a dry year. By Lowell Sumner



DONNER SUMMIT (camera pointed south). Mount Lincoln and Sugar Bowl at right, 4 miles distant. Altitude range, 7,000-8,000 feet. Snow gone from south slopes and ridges, but holding on main runs. Below, CASTLE PEAK (south), $3\frac{1}{2}$ miles. Variety of north-facing slopes and bowls.

Even in a dry year this region has more snow than the minimum necessary for a successful development. A large-scale enterprise should have this assurance of a full-length season. The total capacity of this area—the most highly developed in the state—is not yet touched. Fuller development is planned.



MOUNT RALSTON (south). Edge of Desolation Valley at right, 4 miles. Altitude range shown, 7,700-9,300 feet. Good bowl formation: slopes unusually open for this elevation and latitude. Access is the unsolved problem on Ralston; a road around Echo Lakes would destroy the unique character of the summer-homesite development on national forest lands. Desolation Valley is in a Wilderness Area.

FREE PEAK (south), 4 miles, 6,500-10,900 feet. Good bowl formation east of summit. Snow pattern shows effect of wind and proximity to Lake Tahoe, 6 miles from summit.

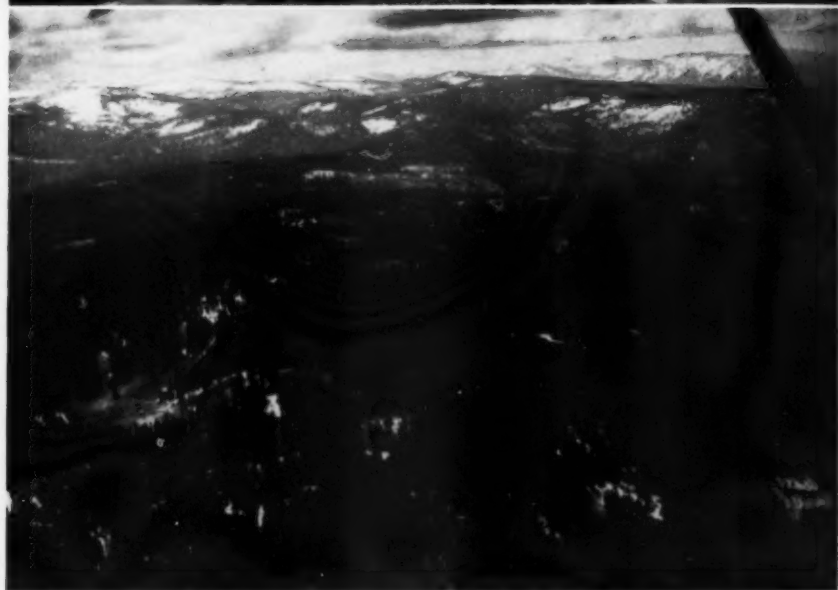
This is an example of an unpublicized area which seems to justify further on-the-spot investigation as a possible site for development. Highway 50 skirts the area.

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CARSON PASS (south). Hope Valley in foreground; the pass, with a variety of open slopes, in upper right, 6 miles distant; 7,300-10,400 feet. The region has great possibilities, but is now too inaccessible from cleared highways (either U.S. 50 or U.S. 395). The best slopes are out of the picture, to the right. Rerouting of U.S. 50 over Luther Pass would open the area in winter.

STRAWBERRY LAKE AREA (southeast; lake out of picture to the right). Accessible, intermediate-type terrain. To ridge in center, $3\frac{1}{2}$ miles; 7,000-8,500 feet. This area could accommodate almost unlimited Class C development and is nearest of all areas to the San Francisco Bay area population. Access to the Sonora Pass summit area, out of the picture to the left, would require realignment of the Sonora Pass road.



JUNE LAKE AREA (south). Mammoth Mountain at left in clouds. To Gull (second) Lake, 3 miles; 7,600-11,000 feet. The snow line at this season is 3,000 feet higher than on the west slope of the Sierra. Nevertheless, the Mammoth Lakes area near by (but not shown) is one of the most promising in the Sierra. It is accessible by highway, well developed for summer use, has a long season, great variety of terrain, and affords 2,500-foot, north-slope runs off Mammoth Mountain.

BADGER PASS, YOSEMITE (southeast). To cleared area, 1½ miles; to Ostrander Lake area, upper left, 7½ miles. Mount Raymond at upper right. A development in red-fir belt, which indicates, by comparison, the desirability of placing ski developments in more open country. Snow depths here are minimal for an enterprise of this magnitude.

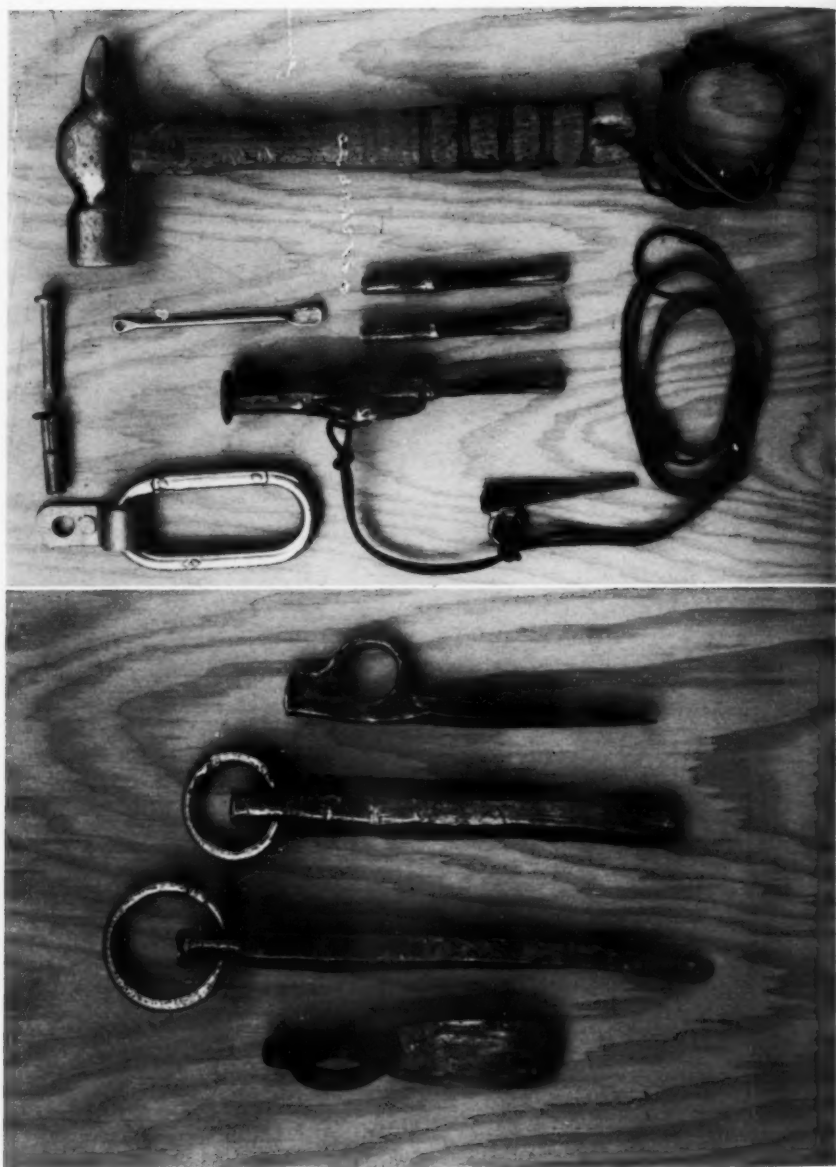
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MINERAL KING (southeast). To Farewell Gap, right of center, 6 miles; 7,000-12,000 feet. Great variety of bowls and canyons; avalanches destroyed some of the valley structures several years ago. Probably the most spectacular site for commercial development on the west slope of the Sierra. Major realignment and costly snow removal, chargeable only to skiing, would be required for full development of the site. It is now excellent ski-mountaineering country.

PEAR LAKE AND VICINITY, SEQUOIA NATIONAL PARK (southeast). Great Western Divide and Kaweahs on skyline. To Tablelands, at left, 5 miles. Altitude range shown, ca. 7,000-13,800. Ski mountaineering and ski touring country. The addition of other huts than the one at Pear Lake would permit circle tours.

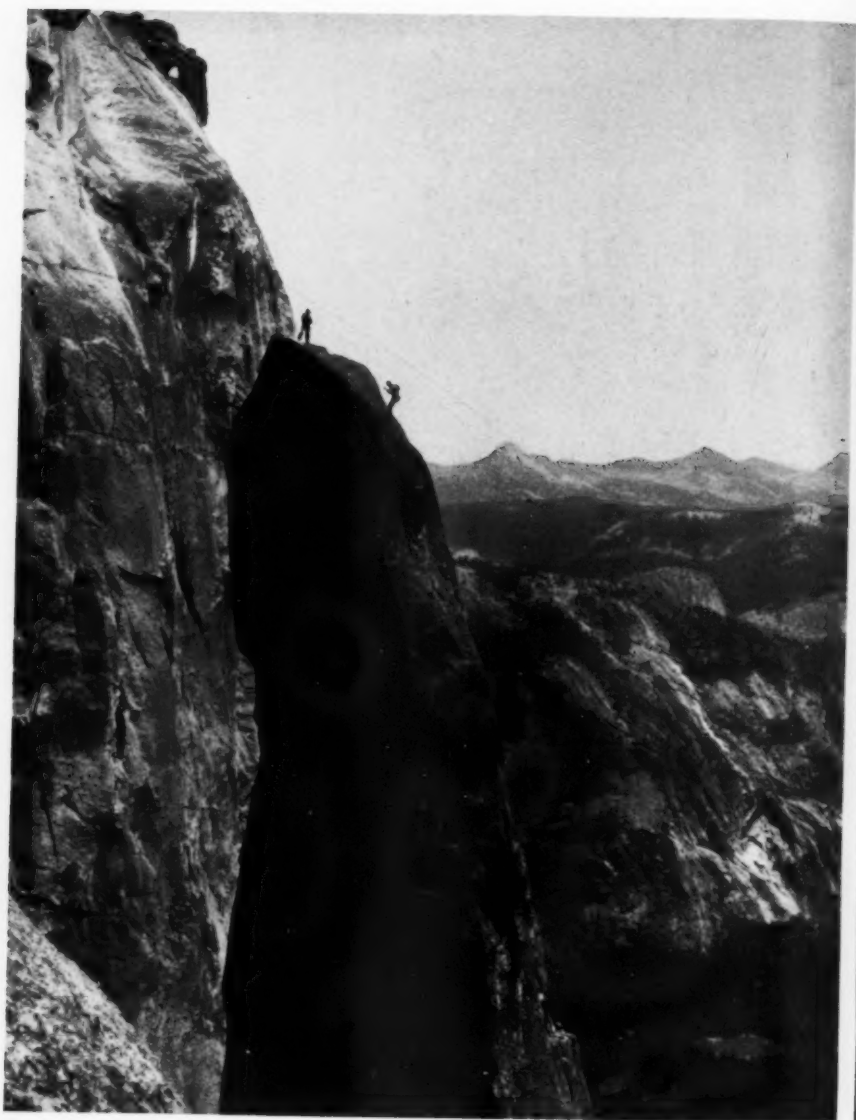


LOST ARROW HARDWARE. The "spoon" dips rock dust from expansion-bolt holes. By Pirkle Jones

LOST ARROW
By Marie



LOST ARROW FROM YOSEMITE POINT, showing Third Error and Last Error with a man on each.
By Marie Zaepfle



THE ARROW AND THE CLARK RANGE By Marie Zaeffle

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Five Days and Nights on the Lost Arrow

By ANTON NELSON

WHAT IS required to climb Yosemite's Lost Arrow? For years many determined men had tried to find out just that. In trying they succeeded only in showing how terribly close to unclimbable the Arrow really is. Then, on September 3, 1947, John Salathé and I completed a successful assault which we had begun 103 hours earlier at the base of the spire.

True, men had stood atop its summit one year before when a trip from the rim was ingeniously engineered by four Sierra Club climbers. Spectacular and effective though it was, this maneuver required very little real climbing; it was in effect an admission of the Arrow's unclimbability. The problem the Arrow poses for the climber is to ascend from the base up through the ramparts of the great chimney that cuts the spire away from the cliff, and past the three intermediate ledges, called Errors, until he reaches the summit, facetiously called the Fourth or Last Error.

A full story, although it ought to be exciting, would take too much space for present purposes. In its stead, a brief description of the preparations for the ascent is presented for prospective Arrow-climbers:

The equipment carried was the best we could make or buy. The only expensive item demanded by this "poor man's sport" was a 120-foot nylon rope, $\frac{7}{16}$ -inch in diameter, used for belaying, which cost \$22.00. Two-rope technique was not used; it would have been too burdensome to carry the extra rope and hardware. Alternatively, when carabiner drag increased the static inertia of the rope to an unwieldy point, the leader would descend from his top three pitons. Taking out the lower ones, he would ascend again, leaving one sound piton perhaps every 20 or 30 feet. A 300-foot rappel rope of $\frac{5}{16}$ -inch Manila supplemented the nylon on the longer leads. A 150-foot length of $\frac{1}{4}$ -inch sisal reserve rope was used for many things besides hauling up the 30-pound pack. Each of us carried 150 feet of stout fishing line for bringing up extra equipment on complex leads.

Each man hung on his belt three multiple-knotted slings. Most of the holds for which one would wish were absent on the massive rock, which averages 80 to 90 degrees for two-third of the route. Thus, nearly one-half of the moves upward demanded some type of direct aid. Now slings may be a little messy—for photographers—but hanging directly on the climbing rope for any length of time is unfeasible. It hurts one's kidneys, cramps one's motions, and leaves one always below his highest piton. On the other hand, standing in a sling, one can rise somewhat above his highest piton,

thereby extending his reach a foot or two. Hanging directly on the climbing rope makes one a continuous burden to his belayer, and decreases the safety factor in no small degree since the leader's weight is pulling partly outward on the piton instead of downward only. On the Arrow we often used pitons that were barely adequate to sustain a man's weight, sometimes only a part of his weight. Their use would not have been possible without slings. The second man usually ascended by slings attached by prusik knots to a fixed rope. Direct aid was often used, even on successive stances which on a 100-foot practice climb could be climbed by class-five techniques. Safety depends upon an adequate reserve of strength and we simply had to conserve our strength for the long unknown grind ahead. Stirrups of $\frac{1}{8}$ -inch duralumin prevented the bruising and cramping of foot muscles that is produced by standing in slings in tennis shoes.

About 18 pitons were used, but these we drove in hundreds of places. More pitons would have increased the handicap of weight. They were all hand-forged by Salathé. A few horizontals of 10/20 soft iron were of but little use. Those of 60/80 carbon steel were better, and most useful for driving directly into rotten, crackless granite no other device could overcome. Pitons as good or better were made of 40/60 carbon steel with vanadium in it—the alloy from which Model-A Ford axles are made. Some were forged to wide, short blades with hair-thin tips for use in the tiniest cracks. Then there were angle pitons of 10/20 iron such as were used by the Mountain troops. There ought to be even wider pitons.

An improved type expansion bolt—a "Dryvin"—was used. The $1\frac{1}{2}$ -inch shield fits a $\frac{3}{8}$ -inch hole. This is slipped over a hanger about one inch wide and four inches long cut from $\frac{1}{8}$ -inch iron with holes drilled for the shield and for a carabiner. It is secured by driving in a nail or peg $\frac{1}{4}$ inch in diameter. Tests have shown that in solid granite or other sound rock it will sustain more than 500 pounds pulling directly outward or over 1000 pounds pulling perpendicular to the axis. The beauty of it is that it takes one-ninth as long to drill in as a $\frac{3}{4}$ -inch bolt and is just as strong in design. The holes are made with a $\frac{3}{8}$ -inch star drill cut to five inches in length and tempered in oil for maximum hardness. These drills fitted into a heavy handle designed to absorb the shock to the hand. Regular masonry twist drills seem satisfactory, too, but carbaloy drills do not seem to cut well in granite or marble. A spare handle, several drills, and parts for a dozen and a half bolts were carried. A third hammer (one can count on dropping one) was carried, also. The best hammer had a steel shaft continuous with the head and a modified claw cut and forged to permit extraction of the drive-in nails of the bolts.

Justification for the use of expansion bolts is not required on such a climb as the Arrow. They are a waste of time, however, as a ladder up just any sheer cliff. They are never a substitute for pitons, and are of doubtful use in poor or rotten rock. Their use is fair, it seems, when one is bridging a holdless, flawless, high-angle face on sound rock to a place where pitons or holds can again be used. They were used in only three places on Lost Arrow. Four or five were used for getting out of a converging, overhanging chimney called "The Alcove" in the massive face one pitch above the ledge about a quarter of the way up. This pitch is the key to entering the Great Chimney, a good safety valve for testing a party's fitness to go higher. Three more were used about two-thirds of the way up, where a 150-foot lead of extreme difficulty took eight hours to overcome. They made possible a 20-foot upward traverse across a smooth 90-degree face. Then perhaps ten bolts were used, to supplement two pitons, in the top 50 feet of the flint-hard and flawless Arrow tip.

Twelve carabiners were needed. Some special Arrow equipment was invented, including, among other things, what can best be described as a sky hook. This was actually put into play on a traverse of the summit pitch to provide support from an otherwise useless solution pocket that just had to be used.

Weight and bulk of equipment was a limiting factor in personal needs, also. Water was the heaviest material, so the supply was limited to three quarts per person and was carried in a plastic bag. This will last up to five days if one does not sweat too much and can discipline the growing temptation to drink. It must be admitted that friends relieved our self-denial on the fourth day with liquid lowered from the rim to Third Error. A number 2 can of fruit jucie was held in reserve for a victory toast at the top. Because of the exertions of the day we wet our mouths a little at dawn, took a sip or two at mid-day, and drank most of our liquid at night. Charles Wilts and Spencer Austin, who had reached the previous high point on this route, warned that too much liquid is a major drawback. The dozen or more cans of fruit juice they jettisoned made one wonder how they ever had the strength to haul it all up or how they ever got in through some of the narrow places.

What small amounts of food we ate were rationed in the same way as the water. We believe that the ideal food is raisins, dates, walnuts or peanuts, and fruit-flavored gelatin candies, and that heavier foods, such as starches or meat, would hardly be digestible under the strains of Arrow climbing. We needed no more than four or five pounds per man for the five days. That we should lose a great deal of weight on the climb was assumed.

A small first-aid kit was carried, as well as a rubber-sheathed flashlight. To supplement regular clothing against the chill winds of the bivouac, flannel inner pants, long wool socks, and a wool sweater or *light* parka were worn under our other clothes. However, a small, light zeltsack might be a better expedient. Equipment not in use was rolled inside two burlap sacks to prevent its abrading on the rocks.

Our basic idea was that we would climb safely or not at all. We understood that rescue from an accident in the Great Chimney was not to be expected. Bombproof belays were in order and unprotected leads of more than 10 or 15 feet were out of order. When the leader had to take a long chance he did so only when pitons (or bolts) that were sound enough for the anticipated fall were near by and the belayer was on special alert. Then the most that could happen (and not infrequently did happen) was that the leader would take a controlled fall and go right back to work.

For climbing on the Arrow, great strength is far less important than patience and endurance. On the first ascent each of us had been on the Arrow four times before and twice we had set out together for at least three days' work. On Memorial Day, 1947, the route became the bed of a waterfall and ended in a precarious rappel. On Fourth of July week end, much was learned during two days and a night on the rock, in which Second Error was attained for the first time. Better equipment was needed. We had thought ourselves in the pink of condition, but after only two days the state of nervous and physical exhaustion dictated retreat and far more rigorous preparation for the next attempt.

Several bivouacs on cliff walls, with or without warm clothes, taught us not to expect much rest on a climb. I took a hike the length of the John Muir Trail, practicing making long marches with little or no water. Doing that for four days in one's own home is good enough practice for mastering thirst—for learning, that is, how much thirst is to be safely endured. If one lacks time for long periods in the mountains, running steadily for an hour or so is a good way to build up the heart, lungs, nerves, and muscles for the long endurance at higher altitudes needed by any kind of mountaineering activity. To prevent the onset of cramps one needs brisk calisthenics to train climbing muscles far beyond their normal capacities. On the Arrow, failure to hold oneself to comparable preparations may be sufficient to scuttle a team's most carefully laid plans, and it has done so more than once.

For prospective Arrow climbers, it is important to have or acquire experience and competence with things mechanical; a manual acquaintance with forces, materials, and their relationships is a must.

This brings one to the matter of practical philosophy. One cannot climb at all unless he has sufficient urge to do so. Danger must be met—indeed, it must be *used*—to an extent beyond that incurred in normal life. That is one reason men climb; for only in response to challenge does a man become his best. Yet any do-or-die endeavors are to be condemned. Life is more precious than victory. In the safest possible climbing on the Arrow there is more than enough stimulus from probable and present danger. To know one's limitations and to keep within them is the essence of good sense. A comparatively weak party, sensitive to its weak points and keeping within their limits, will outlive and outclimb the strongest team which proceeds indiscreetly.

One thing is *not* an adequate motive for climbing; that is egotism or pride. Yes, most of us who climb usually play to the crowd, as such an article as this may demonstrate. However, mere self-assertion alone has a low breaking point. To keep going day after day under heart-sickening strenuousness requires a bigger, more powerful faith than in oneself or in any concept of superiority.

Conversely, I feel that a man who, through emotional temperament or habit, is used to the false stimulus of alcohol has two strikes against him before he undertakes a long climb. The psychological impact of continually new and increasing difficulties while one's physical resources seem to be running down is enough without being fettered by an undisciplined imagination or by emotional crutches. Human limitations are indeed more serious than the natural ones to be faced.

A brief description of the first ascent may illustrate some of the foregoing points. In 1937 the 350 feet to First Error took 6 hours; 35 pitons were used for protection. In the 1947 ascent of the Arrow, we passed that point, hauling our 30-pound pack between us, in just three hours, using no more than a dozen pitons. Time was a major limiting factor and all possible haste was made when there was a chance. Nearly half the distance, 650 feet, was beat out the first day in the 13 hours before darkness fell.

On the second day increasing problems really began slowing us down. We rope-traversed from the detour going out to Second Error back into the narrowest portion of the chimney where it slashes nearly 100 feet into the heart of the cliff. At midday we arrived at the vertical headwall of the chimney where Wilts and Austin had turned back on their second attempt after two and a half days. From then on the class-6 climbing began in earnest; 350 feet were made the second day, 200 each on the next two, and the last 50 feet on the morning of the fifth day. The first pitch of this sort, 150 feet long, was mostly rotten granite. Salathé led for 8 hours

without relief, save for the interruption of darkness. Two pitches above this point, massive, overhanging blocks had to be climbed by the exceedingly wide cracks between them. Often there seemed no evident route at all.

After the second day our muscles no longer cramped and we put thirst in its place. Bivouacking on the chockstones with our feet dangling, our backs aching where they were being nudged by granite knobs, and our shoulders tugging at their anchors, we got little sleep. Cold winds barely permitted us to keep warm enough for the rest essential to the digestion of food. The hours until dawn should permit the greater comfort of climbing were passed largely in talk. Food, sleep, and water can be dispensed with to a degree not appreciated until one is in a position where little can be had.

Future Arrow climbers need not worry about varying the route; there is problem enough finding just one route, let alone fretting about alternatives. It should be noted in all fairness that on the first ascent the bolt-removing hammer was lost on the first day, necessitating the ruination of nearly all existing bolts. Extra hangers for the upper reaches were needed. Most of the holes are therefore hopelessly jammed with broken-off bolts. The work will have to be done all over again by the next party. Getting off the climb requires a long rappel down the narrow confines of the chimney. However, we prusiked from the Third Error to the rim on a fixed rope, since friends were on hand to help rig it.

Frank Kittredge, then superintendent of Yosemite, asked if the 1947 Labor Day ascent of the Lost Arrow were not "the longest and most difficult high climb on record, presumably on sound rock . . ." It is merely pointed out that Lost Arrow granite can often be far from sound. The Lost Arrow *can* be climbed again, perhaps in only four days. At any rate its superb challenge is there. To those who made the first vertical traverse of its Four Errors it stands as a symbol of high and unforgettable adventure.



The First Ascent of Mount Confederation

By JOHN D. MENDENHALL

ANYONE DRIVING up the Banff-Jasper Highway in the Canadian Rockies does well to stop at Sunwapta Falls, where a substantial foot bridge leads directly above the river's savagely churning cauldron. The view southerly up the broad Athabaska Valley extends from the somber battlements of the Fortress-Dragon group upon the right, over the glistening ice of Mount Quincy and the sable cliffs of Blackfriars, and ends with the isolated brown towers of Mount Confederation to the left.

The latter peak, apparently named after the Confederation of the provinces that was so important to all Canada, defied six attempts at conquest prior to 1947. The first known assault upon the 9,740-foot summit was made in 1927 by the guide Hans Fuhrer, with A. J. Ostheimer III, who decided that the southwest arête offered more promise than the northwest ridge. In 1936, Cromwell and North attacked the west portion of the south face above Gong Lake, traversing easterly for two miles and storming the east ridge. This determined pair was halted by difficult rock but five hundred feet below the summit. In 1939 a gallant team from the Appalachian Mountain Club, the Misses Fuller and Reid (now Mrs. Orcutt), attempted the northwest ridge. The fourth party, consisting of Mr. and Mrs. David Millar and Miss Knowlton, left their cairn upon this arête in 1940.

Later the same year, Mrs. Mendenhall and I climbed directly up the long couloir that splits the east cliffs of the west cirque, gaining the northwest rib just below the final steps. This climb was plagued by rain and thick mists, while ricocheting rocks required careful timing when we crossed the gully. Above the notch, balance climbing on the slippery rock was unsafe, and outmoded pressure tactics were employed as we forced our way upward in the blinding mists. We agreed to continue if the visibility improved or the rain ceased. Cease it did—but thick snowflakes quickly limited our "horizon" to sixty feet, and route finding became very difficult. Furthermore, to bivouac in our soaked condition would have been unwise. In the inspiring words of Andreas Maurer, "Where the clouds can go men can go; but they must be hardy men." Hardier men were required, and we roped down in thickly swirling snow. The September weather remained bad, time ran short, and we conceded defeat.

In 1941, Mr. and Mrs. Philip D. Orcutt reached 8,800 feet upon the east ridge, being turned back by a combination of new snow overlying

bad rock. My defense work began in 1940, and the day seemed remote when Ruth and I could once more battle the mountain and its allies—the rain, snow, clouds, and swamps that formed defense in depth. We spoke often of the peak, and it gained a definite personality in our thoughts. Other climbers must have had this experience, when they have struggled upon an unclimbed crag or a virgin face. This was the situation in 1947, when it was finally possible for us to return to the attack. Six parties had sought success amid the rose quartzite towers, and we could but hope to be the proverbially lucky seventh. By mere chance, we also started our pack in from Sunwapta Falls upon the seventh of July! But our car had been deluged with rain the preceding day, and we knew that snow had probably been lacing the peaks above the sullen clouds.

A generous amount of planning preceded the trip; it was essential to be prepared for any reasonable contingencies of weather and technical climbing difficulty, yet hold our packs to weights that would permit us to cover the wild miles of windfalls, swamps, and huge talus. Despite a well-planned commissary that totaled but three pounds per day for both of us, ice and rock equipment joined with tent, extra clothing, and myriad other items to make formidable loads. I was dismayed to discover that my pack weighed ninety-four pounds, while Ruth's bulging burden almost burst the seams of her sack! After every dispensable object had been eliminated I hopefully reweighed my pack. Result—ninety-three pounds! We resignedly shouldered our elephants and plodded southward.

As the snow-streaked cliffs of Mount Confederation gradually rose higher above the wild valley of the Athabaska, we anxiously studied the peak's defenses. The recent storms had deposited a layer of snow atop last winter's ice, so the mountain would not be in the best condition. However, as is always the case with the northern mountains, one must move into position and strike upon the first half-favorable day.

A few miles had been covered by now, and the inspiring icefields of Mount Quincy vied with the dark precipices of Fortress Mountain. But even the long Canadian day was drawing to a close, and we made camp with hopes that the light patters of rain did not presage ill weather upon the morrow. While Ruth did wonders with wet kindling, I erected the tent, covered our equipment, and tried to read the minds of the clouds.

The next day dawned pleasantly, and we hurriedly packed and trudged on up the Athabaska Valley. The schedule called for establishing a high camp in the west cirque of Confederation the following day, so we pressed onward over the undulating terrain that gradually rose toward our goal. The trail signs became faint after the first few miles. Blazes were old

and infrequent, and 1940 taught us to follow the marks of the elk and the great moose—tracks, worn logs, sometimes only hair snatched by the branches indicated the proper way through the maze of fallen timber and swampy ground. The beasts had located the best paths and their weight had broken or worn down some of the obstacles. Accordingly, whenever the way was lost in the windfalls, we dropped our packs and ranged up and down hill until another promising game trail was located.

By late afternoon, Confederation was a reddish brown, snow-streaked pyramid dominating the east, Mount Columbia and the Twins soared above the groping fingers of the Columbia Icefield to the south, and Chisel Peak and Serenity Mountain invited us to visit the Fortress Lake country. Near at hand the raging, thundering Athabaska, gray from the glaciers that spawn it, rolled toward the Arctic. It was a majestic scene, and excited our outspoken admiration even as we proceeded with the commonplace duty of placing a cache above reach of marauders. Soon Confederation, mighty Alberta, and the ermine Twins were bathed with alpenglow, and the short Canadian night fell as we sought rest against the hard ground.

The next day brought rugged packing—first up interminable slopes of down timber, where the small logs repeatedly broke under the weight of man and pack. Next were huge, moss-covered blocks, somewhat treacherous but a relief after the woods. Rough but easier ground followed, then fourteen hundred vertical feet of talus. In our subconscious minds dwelt the thought, "What if one of us breaks a leg, as the heavy pack and the snapping timber conspire with gravity to cause a fall?" Reaching camp could be more serious than the technical climbing above.

The 7,000-foot campsite was attained by two-thirty, and we surveyed the 2,000-foot cliffs that form the east wall of the cirque. Confederation lost little time in unlimbering his armament, and rocks and snow cascaded down our route of 1940 to warn away two brash humans. It was decided to ascend the entire northwest arête rather than follow the steep couloir of the previous attempt. Although the ridge would entail a longer, more difficult climb, we would be spared falling rocks and the weight of crampons. After a hearty dinner, we sought our bags early.

It was barely gray as we arose, July 10, but signs indicated at least a few hours of good weather. As it grew lighter we started up the cirque toward the lowest notch in the northwest ridge. This col was utilized by the Misses Reid and Fuller in 1939. Although they did not attain the summit, they deserve credit for finding the most practicable route upon the mountain. Accordingly, we named this the "Appalachian Col."

Within an hour the pass was underfoot, and we roped up for the ascent. The cornice was quite unstable-looking; in common with all that were seen this day, it was cracked and apparently anxious to plunge down to the North Glacier eight hundred feet below. It was fortunate that none of our activities called for frontal assaults upon the rotten masses that graced the ridge at intervals.

Mindful of the long ascent before us, we climbed continuously whenever possible. Now climbing a wet chimney overhung by a mass of snow, now belaying carefully across a cracked cornice, we mounted steadily as the wild, gaunt peaks to the northeast dropped below. Our route was bathed in sunlight, although ominous clouds marshaled over Fortress Lake and dark reinforcements obscured the Columbia Icefield.

Suddenly we surmounted the square-topped mass that ends the lower, easier half of the arête, and the final towers of Confederation were in full view. Ruth correctly felt that the inspiring eight-hundred-foot battlements directly before us formed the highest point, while I feared that a peak beyond, topped by an enormous frowning cornice, might be our objective. Even if the closer tower were the higher, a difficult ascent was still in store. I guaranteed to her that we could reach the airy platforms of snow half way up the cliff. What lay above would obviously require careful climbing. With a glance at the darkening horizon to the southwest, we passed our high point of 1940 and pressed onward.

Out to the left, far above the North Glacier, traversing on snow that once partly fulfilled its threat to collapse. Then up steep rock, evilly plastered with thick slabs of moss that perpetually oozed water, so that the rock was ever slimy. Now over exposed pitches, with holds square and well spaced. Finally we gained the platforms and stood face to face with the grim keep. As we did so, Confederation summoned the ally that had bested us seven years before—the sun was blotted out, a chill wind with an edge sharpened upon the blue glaciers of Quincy struck us, and alternate flurries of snow and rain made the slippery rock more treacherous.

Racing the weather, we lost little time in attacking the most likely-looking weakness in the peak's defenses, a steep crack plagued with frigid water from the block of ice that was wedged like a chockstone above it. After a few minutes' struggle in the chilling drizzle, I was compelled to admit defeat for the moment and descended to find a more suitable route. The best chance appeared to lie up a face to the right, absolutely vertical but with good holds above the first ten feet. Before I started the pitch, Ruth called that the rocks appeared to offer a good chance to the right, just before they plunged eighteen hundred feet to the west cirque.

Excitedly, we descended a snow-covered ledge, and prepared for what was apparently the key to the mountain. Ruth took up her belay position upon a sound rock, then I made a long step to a scanty, out-sloping slippery hold. Two fingers found a shallow wrinkle, and a long reach upward yielded a comparatively good handhold that accommodated four fingertips—with the discovery came the happy realization that the pitch was definitely conquerable! This section illustrated one of the prime inconsistencies of difficult climbing, namely, that mountaineers seek severe routes, yet are relieved when the pressure eases. After running out fifty feet of nylon, I found a good belay spot where a rib split the gully. Hoping that Ruth would not pendulum into space from the slippery knobs, I called to her to climb. My concern was dissipated when she speedily climbed past them. The route now led inexorably to a steep couloir that split the final towers—a snow chute that had previously been considered as a last resort because it was obviously a favored track for rocks. Well, here were we, hopeful that the cold wind would stabilize the debris above.

A long, airy step and a few feet of careful climbing were followed by continuous going—a boon, in view of the cold wind and the time element. A short stretch of snow preceded exposed rock, slimy in the rain but preferable to the scarred couloir. The windy arête was soon underfoot and gaps in the clouds afforded a splendid view extending over barren peaks to the glaciers of Brazeau. However, our attention was riveted upon the final cone of steep snow that capped the ridge before us. Ruth provided a firm belay while I cautiously ascended the slope. The snow was underlain by bluish ice, and could either plunge almost two thousand feet to the North Glacier or cascade down the couloir that we had recently quitted. The angle eased off above, and I belayed around my axe as Ruth climbed the steps. A few seconds later, about 1 P.M., we stepped together upon the highest point of snow, ending the campaign that started seven years before.

North and west, the view was blotted out by clouds that towered high overhead. But the majestic, glacier-clad peaks seen through rifts in the clouds to the southwest, south, and east were most inspiring. Symmetrical Mount Columbia, flanked by ice-sheathed King Edward and the Twins, dominated the southern end of the Athabaska Valley. The impressive pinnacle of Warwick Mountain vied with the most audible challenge of glaciated Quincy west of the Valley, while mighty Alberta towered above a maze of ice and rock to the east. In the foreground, south of our summit but beyond Gong Lake, the fang that is so impressive from the River had become an insignificant minor summit.

Southeast, up the Gong Valley, the view was gaunt and forbidding. Glaciers riven with icefalls separated the slopes from the cliffs above. Next was an impressive turret about 10,300 feet in elevation, guarded by a long, crevassed tongue of ice. North of the broad glacier that closes the head of Gong Canyon and east of our vantage point, the wild peaks above the Sunwapta thrust gnarled knuckles skyward, while the clouds permitted occasional glimpses of Mount Brazeau and its glaciated satellites.

In the chilling wind that numbed bare fingers and made photography a burden, even the grandeur of the view did not erase thoughts regarding the problems of our descent. Far below, our line of tiny steps dipped and climbed and dipped again as they followed the arête to the safe going far below. Eager to start upon the long and slippery descent, we found that the hour upon the summit dragged interminably. We erected a cairn upon a windswept ledge of rock east of the snow cap and then, after a compact lunch, we welcomed the warmth of movement and the concentration demanded by the unstable going. Time was passing rapidly, and it was quicker to climb down than to set rappels. Lower and lower we went, moving consecutively through swirling flakes and mists. The critical traverse was readily passed and the exposed but simple rocks above the North Glacier were soon attained. At this point, Mount Confederation sportingly replaced the clouds with welcome sunlight.

Racing the sun, we moved continuously down the ridge wherever possible, not neglecting to move carefully over the cracked cornices and down the damp chimneys. The rocky gully was reached just before dark, and it was a relief to unrope after fourteen hours. We got to our tent almost eighteen hours after our departure.

The following day I soloed the highest point of the northwest ridge. Then two nights and a day of driving rain confined us to our tent. With food running low, we decided to climb the towers that terminate the northwest ridge, overlooking the Athabaska Valley. The climbing was upon steep, loose rock, challenging but an anticlimax. After topping all the fingers, we returned to camp and packed down to the Athabaska.

The next day we headed out, regretfully leaving the beautiful alpine scenery—the glittering glaciers, the soaring rock walls, yes, even the biting winds and swirling mists and flakes of the heights that had become almost a part of our selves. In this world that has so much of chaos, it is comforting to know that the mountains are there, mountains that have stood while dynasties have risen and fallen.

Sierra Club

Founded 1892

To explore and enjoy the mountain regions of the Pacific Coast; to publish authentic information concerning them; to enlist the support and coöperation of the people and the Government in preserving forests and other natural features of the Sierra Nevada

JOHN MUIR, President 1892 to 1914

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Memorials

ERNEST DAWSON (1882-1947)

By PHIL S. BERNAYS

A KINDLY MAN with unbounding energies; small of stature, large in experience; independent in thought with a devotion to Christian principles which was borne out in performance—such a man was Ernest Dawson. That he was a man whose interests were varied was shown by his desire, even after he opened his own bookshop in 1905, to become a Congregational minister. He had a great love for travel and exploration, having once or twice taken a solo backpacking trip in the Santa Rosa Mountains before there were any trails. In 1911 he made his first trip to Europe, traveling through France and Italy without any baggage. Two years before this he had become an ardent member of the Sierra Club. He led many of the early week-end walks of the Southern California Chapter, became chairman of the Local Walks Committee, and for many years wrote the schedules. His friendly, helpful nature won him many admirers, and soon after leading a party up Mount San Jacinto—in those days a real accomplishment—he became chairman of the chapter.

In his campfire talks on many early High Trips, as well as in his written articles, Ernest revealed a great admiration for John Muir and a longing to enlist others in the growing army of active conservationists which the Sierra Club was even then inspiring in its fight for the preservation of Hetch Hetchy. Dawson contributed both money and labor to the building of Muir Lodge in the Sierra Madre. He evolved the idea of raising funds by leasing "20-year lockers" to members at fifty dollars per locker, all payable in advance. He encouraged skiing in the days prior to the building of Clair Tappaan Lodge, and was instrumental in getting into the club a group of about fifty skiers of college age who were under the leadership of Walter Mosauer—a group that became the Ski Mountaineers Section of the Southern California Chapter.

According to his elder son Glen, Ernest Dawson "climbed before the days of the use of ropes, but never discouraged me from trying the most difficult climbs. He climbed a number of the major peaks in the Sierra Nevada and was always enthusiastic about taking large parties up them." His climbs outside the Sierra included Mount Rainier, Grand Teton, the Jungfrau, and the Matterhorn.

I once heard Judge Clair Tappaan say that he hoped some day Dawson would become president of the club. His hope materialized in 1935, when Dawson began his well-deserved two-year term, culminating a period of fourteen years on the Board of Directors.

He was a member of the State Park Commission in 1939 and took very active interest in the problems of the State Parks.

Whatever Dawson did he threw himself into completely. Whether it was buying or selling books—for which he was known abroad as well as locally—or whether he was befriending the needy who were deserving or championing the cause of conservation, he did it wholeheartedly. This was true as well of his instilling a love of the out-of-doors into his children. In the fall of 1946, shortly after the onset of an illness he knew might well be fatal, he traveled with his children and grandchildren to Kings Canyon, where the directors were holding their annual mountain meeting. This brought to my mind a picture of the man I have long remembered and cherish most

—his devotion to his family. Time after time, on week-end overnight trips, he would be seen caring for his little brood, putting them to bed as close to a stream as he dared, and in the morning at sun-up getting them an open-air breakfast. Then he would start off with them, at the gentle pace they could best keep up with, along and up some pleasant mountain way.

THEODORE SEIXAS SOLOMONS (1870-1947)

BY FRANCIS P. FARQUHAR

THROUGHOUT the first five years of the Sierra Club's existence no one excelled in enthusiastic pursuit of the club's purposes a young charter member, Theodore S. Solomons. He eagerly explored the High Sierra regions and abundantly published authentic information concerning them. Coupled with his enthusiasm was an ability to write lucidly about his travels, so that even today his articles in the *Sierra Club Bulletin*, *Appalachia*, *Overland Monthly*, and *The Traveler* are entertaining as well as useful historical records. He was also a good photographer, faithful to his work even to the extent of packing heavy equipment and glass plates into the roughest country.

Solomons had a great ambition for the Sierra: namely, to find a trail route as close to the main crest as possible, so that one could travel with pack animals all the way from Yosemite to Kings River Canyon. It is today hard to realize how inaccessible the high mountain regions then were. In vain did Solomons, from 1892 to 1896, try to work southward near the crest. Always he had to divert his route downward into canyons. From Tuolumne Meadows, in 1892, he crossed to Mount Ritter and descended to Fish Creek Canyon. In 1894 he further explored the headwaters of the San Joaquin, visiting Mono Creek and Bear Creek. He climbed Seven Gables and gave it its name. Snow, in late September, forced him to leave the mountains. The following year, 1895, saw the climax of his efforts. Pushing up the South Fork of the San Joaquin, he named a group of peaks at the head of one of its branches for the philosophers in whose works he delighted: Darwin, Haeckel, Wallace, Fiske, Spencer, Huxley—the Evolution Group. He climbed Mount Wallace, then moved up the next canyon and climbed Mount Goddard. He and his companion, Ernest C. Bonner,¹ were knapsacking on this trip, else they never would have succeeded in covering such rough territory as they now assayed—Disappearing Creek, with its Enchanted Gorge, lying between Scylla and Charybdis—all Solomons' names. Down to Simpson Meadow they struggled, then, after a visit to Tehipite, they climbed up to Granite Pass and at last reached the canyon of the South Fork of Kings River. They had not opened a high mountain route for pack animals, not even for themselves, but they had done a valiant bit of knapsacking that was to be the inspiration for many a successor. What is equally important, Solomons wrote a fine account of his trip which was read before the Appalachian Mountain Club, in Boston, the following January. Not only was this paper published in *Appalachia*, but the Appalachians eagerly asked for more, with the result that two other notable contributions followed. Articles derived from this trip also appeared in *The Traveler*, a San Francisco monthly designed for the tourist trade.

In the summer of 1896 Theodore Solomons again set out with high hopes of perfecting his high mountain route. He accompanied Walter A. Starr and Allen L. Chickering from Yosemite to the San Joaquin region.²² But Solomons was not well

and had to give up before reaching Mount Goddard. He left the mountains by way of Ockenden, while his companions continued to Tehipite and over the Monarch Divide to Kings River Canyon, not, it is true, by a "high mountain" route. Nevertheless, another step had been taken toward the realization of Solomons' ambition.

It was part of Solomons' plan for opening the High Sierra to continuous travel to publish, perhaps in book form, the information he had gathered. Besides his own observations, he had gathered data from J. N. LeConte and, more particularly, from L. A. Winchell, of Fresno, a pioneer in the San Joaquin and Kings River regions. He conducted a very intensive correspondence with Winchell during the spring of 1896. A long memorandum was prepared for the Sierra Club, accompanied by sketch maps and photographs. The best published summary of his expeditions is found in a series of six articles written for *Overland Monthly*, "Unexplored Regions of the High Sierra" (May, June, August, November, 1896, and January, August, 1897), well illustrated with his photographs. Unfortunately for the consummation of his plans, Solomons about this time felt the call of Alaska. For ten years he lived there; then for a while in New York. The Sierra project lagged, and its flame in Solomons' heart almost went out—not quite.

Years later, after LeConte and McDuffie and many another Sierra Club member, as well as the United States Geological Survey, had pushed over the passes and had mapped even the roughest of the High Sierra terrain, Solomons returned to look over what had happened. He even took another trip in the Sierra, described in another contribution to the *Sierra Club Bulletin* (18:[1933]:1, 20-23), entitled, "After Forty Years." A final contribution was made as recently as 1940 (*SCB*, 25:1, 28-40), "The Beginnings of the John Muir Trail."

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JOSEPH CLARK SHINN (1861-1947)

Born on the Shinn homestead near Niles, Joseph C. Shinn made the ranch his lifelong home and was a respected leader in the life of that community. He was an early member of the Sierra Club, joining a short time after his brother, Charles Howard Shinn, who was a charter member.

Joseph Shinn knew and loved the Sierra and had climbed many of its peaks, but he also loved the less rugged peaks and rolling hills of the Coast Ranges in which his home ranch was situated. An active member of the Loma Prieta Chapter of the Sierra Club, he led many week-end walks to near-by Mission Peak or the Sunol hills; and more than once the Shinn family entertained High Trip members at Christmas reunions. Shinn and J. N. LeConte were old friends and companions in mountaineering, and according to Mrs. Shinn the two "belonged to a local East Bay group, called 'Los Diablos,' that made a yearly trip to the summit of Mount Diablo, in the days when there was only a wagon road part way up the mountain. Mr. Shinn always furnished the horse and wagon transportation for this group."

A memorable early trip of Shinn's was that made in 1898 with Mr. and Mrs. Robert Price, Professor Cornelius Beach Bradley, and Miss Lalla Harris to the Kings-Kern region. They crossed Harrison Pass with pack animals, and climbed Mount

¹ Bonner, too, was an early exploring member of the Sierra Club. He died November 15, 1947.

² "From Yosemite to Kings River Canyon, 1896," by Walter A. Starr, *SCB*, 20(1935): 1, 54-67.

Whitney and most of the peaks of that region, including Mount Bradley, which they named over Professor Bradley's protest.

In 1905, Joseph Shinn married Florence Mayhew. While their four children were young the Shinn's did most of their mountain traveling as a family group, making camping trips in the Sierra every summer; later the parents again became active with the Sierra Club and participated in several High Trips. Only a few summers ago, while the Shinn's were camped in the Carson Pass country, Shinn, then 82, climbed 9000-foot Thunder Mountain and other peaks in the vicinity. He was active until the time of his death; he drowned while swimming in a small lake on his ranch among his well-loved hills.

C. E. M.

JOHN HOOD (1926-1947)

Many of our friends have written to us about our son John, who recently met his death in a rock-climbing accident. No one should feel that words are futile at such a time. Words are the vehicle of the spirit and have the power to dispel the dark clouds and reveal the light which makes it possible to trace the deep pattern concealed in the tangled web of fate. We will always remember with deep gratitude.

John lived richly and well. He loved to hear fine music, to read great books, to spark class discussions in history, to solve tough problems in mathematics, to talk far into the night with friends. Above all he loved to climb mountains.

Earthbound men have often wondered why climbing appeals deeply to so many of the finest souls. We believe that it is for them the enactment on a physical plane of the eternal ascent of the human spirit in the quest for truth and beauty, justice and freedom. It demands the conquest of fear and triumph over the weakness of the flesh in a united assault on the ramparts of nature. The reward is an ecstatic experience of beauty and a supreme sense of exaltation.

It is the high destiny of everyone of us actively to participate in that slow and magnificent evolution of which mountain climbing is a symbol.

MR. AND MRS. J. W. HOOD

Mountaineering Notes

Edited by MORGAN HARRIS

ASCENTS IN THE WIND RIVER RANGE

This summer a group of 19 Sierra Club members knapsacked their way into the Dinwoody Valley, in the heart of the Wind River Range, Wyoming. We were especially indebted to Floyd Wilson for permitting us the use of the facilities at his Gannett Peak camp. Its central location permitted ascents of most of the major peaks in the Gannett Peak region.

The east face of Gannett Peak proved to be the most enjoyable of our ascents completed during our stay at Floyd Wilson's upper camp. We ascended the Dinwoody Glacier to the bergschrund and proceeded up the rock. The first two hundred feet were exceedingly steep and required some delicate fourth class leading before we reached a point about two hundred feet below the junction of the east buttress and the summit snow cap. Here we were forced to wait out a storm on a rather exposed ledge. Later we were able to continue, although the wet rock made foot and hand holds very insecure. After a delicate traverse into a shallow couloir we made our way up to the snow and thence to the summit. Once upon the summit we were exposed to the fury of the icy wind; so we hurriedly signed the register and retreated.

Two days later a party of four ascended the north face of Mount Warren. Ropes were not needed except in ascending the snow slope above the bergschrund. From Mount Warren we traversed onto the saddle separating it from Doublet Peak and climbed two of the three precipitous spires in the center of the saddle. Pitons were required for safety. On the summit of the middle tower we found record of a previous ascent by H. Kraus and another climber whose name we could not read.

The Sphinx was climbed by the conventional route which follows the north arête. The Sphinx is one of the first peaks seen as one is ascending the lower portions of the Dinwoody Glacier and it truly fits the shape suggested by its name.

Mount Koven, a little to the north of Gannett Peak, was attempted, but the party was turned back because of adverse weather conditions. ALLEN P. STECK

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FIRST ASCENT OF THE OBELISK

From the ridge east of Geraldine Lake, Jim Wilson and I had our first view of the Obelisk, and it was impressive. The north face appeared to be a bulging overhang, while the south face had an angle of about sixty degrees. We climbed to the notch that separated the peak from the spur and decided that our observations had been correct about the north face. Since the east and west faces seemed to approach the vertical to an alarming degree, we directed our attention to the south face. Here we found a long chimney that went up as far as we could see. The rock was well broken so that the climbing was not too difficult. When we reached the highest point that we had seen from below we found ourselves at the foot of a steep wall approximately one hundred feet in height. This pitch proved to be the crux of the climb, for it was quite exposed and the holds unreliable. Several pitons were used for safety and they were well justified! We were extremely happy that the lead was only 100 feet, for there

were no intermediate belay spots. Once this obstacle was surmounted the route to the summit was clear and relatively easy. The summit was very spacious, as summits go, and to our surprise there was no record of previous ascents. We felt sure that it had been climbed. Six rappels later we reached the ground, just as the last rays of the sun were climbing to the peaks. We estimated conservatively that the height of the climb was about five hundred to six hundred feet. The only factor that will delay its second ascent is the twenty mile "approach" from the road head. This factor, I might add, was not disclosed to us before our departure. Otherwise there might not have been a first ascent!

ALLEN P. STECK

PITONS IN THE TETONS

After large quantities of fresh, soft snow forced us to turn back from the East Face of Longs Peak, Ulf Ramm-Ericson and I beat up the roads to the Tetons, arriving there on June 20 in a rainstorm. We were fortunate in joining camp facilities with a party of Harvard Mountaineers led by Maynard Miller. The conviviality of camp compensated for the bad weather and forced inaction.

On the afternoon of the 26th, Ulf and I took off for the vicinity of Symmetry Spire to get the mold out of our tennis shoes, but like typical Yosemite climbers, we were stopped by the huge talus pile; we compromised by making a first ascent on a minor spire which we named Stanford Pinnacle. The two pitches below the summit required pitons and grunting and proved as interesting as anything in Yosemite.

We then gave man's best friend a break and chipped in with the Harvard gang to rent a pack horse to carry food and air mattresses into Garnet Canyon. From our Garnet Canyon base camp we climbed the Owen Route and found it interesting due to the fresh snow and quantities of blue ice in the upper chimneys. The next day found us wandering around on the North Face of Nez Perce trying to find the summit. At last a register gave us the clue we needed and we were startled to find that ours was the first ascent of the peak for the year. ALFRED W. BAXTER, JR.

THE FIRST ASCENT OF THE UPPER AND MIDDLE WATKINS PINNACLES

The three Watkins Pinnacles jut out from the southwest shoulder of Mount Watkins, on the north side of Tenaya Canyon, above Mirror Lake. They are difficult to see from Mirror Lake due to a lack of contrast between the pinnacles and the wall of the mountain. The best views of them are obtained from the summits of Half Dome and Clouds Rest, and from Snow Creek Trail just below the falls.

On December 16, 1946, Rupert Gates and I started up the Snow Creek Trail hoping to reach the summit of Mount Watkins, and from there to establish a new route down the southwest shoulder to the notch which separates the two upper pinnacles from the sheer south face of the mountain.

We carried over 1,400 feet of rope, not knowing how much would be necessary to reach and return from the notch. Actually we used only 540 feet. The route involved walking down the increasingly steep southwest shoulder for about 400 yards until the steep ice-covered slabs made a fixed rope advisable. By fixing a 300-foot rappel to a tree we could descend with its aid to another tree on the edge of the south face overlooking the notch. From here we could climb to a position about 30

feet lower from which a 120-foot nylon rope could be placed. This last rope, being fixed to pitons, hung straight down to the top of a tree, down which I had to climb to reach the steep, brush-filled notch.

One short pitch from the top of the notch led to a small saddle between the upper and middle pinnacles. Gates led to the razor-edged summit of the middle pinnacle and returned; I repeated his climb and came back to the saddle. The route lies on the exposed south face of the pinnacle and although easy to go up is slightly more difficult to descend.

As it was now 12:30 P.M. on a short winter day, we started our return trip, via the tree and the fixed rope on Prusik knots, without having had time to climb the Higher Pinnacle or reconnoiter the Lower Pinnacle, the summit of which lies over 250 feet below the upper saddle.

In May of 1947 Gates and I returned for an attempt on the virgin summit of the Higher Pinnacle with our team strengthened by Ulf Ramm-Ericson. Our goals this time, were the Upper Pinnacle and, if possible, the Lower. Only the first was reached.

We again reached the notch by the same route and gained a position in the saddle. After leading up to a sloping ledge which runs around the southwest corner of the pinnacle, Gates found a vertical crack about a foot beyond the end of the ledge. Two pitons were placed for direct aid. Although the pitons were secure, the vast exposure prevented the all too easy ascent from being completely dull.

From notch to summit on the Lower Pinnacle is about 130 feet. From various positions we had viewed all sides of this pinnacle. It looks, if anything, more inaccessible than the Arrow. There are severe overhangs on all sides and an amazing absence of cracks. The only route that seemed at all possible would involve bows, arrows, harpoon guns, and other items to get a rope over a large block on the flat summit.

If this could be done, and if the rock held, a traverse, or a Prusik climb, might enable some engineer to reach one of the most fearsome of all Yosemite pinnacles. It is my guess that barring bolt holes and harpoon guns, the birds will long have at least this solitary, undisturbed refuge.

ALFRED W. BAXTER, JR.

THE SECOND AND THIRD ASCENTS OF THE ARROWHEAD BY THE EAST FACE

The first ascent of the Arrowhead by the east face was made by Anton (Ax) Nelson and Fritz Lippmann in December of 1946. The second ascent of the route was made on January 6, 1947 by Lippmann and me, and the third on July 11, 1947, by Ulf Ramm-Ericson, David Cuncy, and me.

Starting from the garbage plant behind the Government Center, about an hour of talus hopping and bushwhacking is necessary to reach the gulley at the base of the East Arrowhead Chimney where the route begins. The first obstacle, a large overhanging chockstone, can be passed to the left by a direct aid step with the leader belayed from a ledge in the cavelike recess under the chockstone. Once around the chockstone the route can be continued up a short vertical chimney and into a scree-filled continuation of the gulley; a small tree furnishes an anchor for the belayer. It is wise for the leader to be careful in this gulley, for there is great danger of accidentally rolling rocks on lower climbers.

The route continues third class up the gulley until a series of ledges makes possible an easy traverse out of the gulley and on to the east face of the Arrowhead Spire. From the base of a large tree the leader must surmount an overhang with the

aid of a hanging branch and continue up and to the left (south) until a large bush affords a belay position. Although only one piton was used for safety on this pitch (it is still in place) one or two more are advisable if suitable cracks could be found.

The next pitch is fourth class with a very narrow chimney near the top forming the only difficulty. This narrow chimney leads to a small saddle below the final pitch up the summit arête.

The most rapid descent can be made by roping down on the west side of the saddle and returning by the traditional route.

ALFRED W. BAXTER, JR.

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THE NAMING OF DUNDERBERG PEAK

The following is quoted from a letter from Birge M. Clark, Architect, of Palo Alto to Walter L. Huber:

"On June 20 my son Malcolm Clark and I climbed Dunderberg Peak above Virginia Lakes in the Hoover Wilderness area of the Mono National Forest. . . . In the summit cairn we discovered a small cannister 4 inches long and $\frac{7}{8}$ inches in diameter. This canister is of tin, considerably rusted, but contained a paper card, in very good condition, headed 'Explorations and Surveys West of the 100th Meridian, Explorations of 1878, Corps of Engineers, U. S. Army.' It was dated September 18-19, 1878, signed by Lt. M. M. Macomb, 4th Artillery, as Executive Officer, Topographic Assistant T. Calvert Spiller, Meteorological Assistant, J. H. Morgan and H. P. Madison (?), en route from Bridgeport, California to Yosemite Valley. The card appeared to be taken from a book, and on front side the peak was named Dunderberg Peak, approximate elevation 12,200."

"On the reverse side there was a further statement as follows: 'This peak is called "Dunderberg" instead of "Castle Peak" in view of the fact that there is a peak north of Summit Station, Cal. on the C. P. R. R. to which the name is more appropriate. Also because the name "Castle Rocks" has been given to some peaks north of the Relief Trail at the head of the Stanislaus.'

"At first we intended to replace the canister in the rock pile, but decided that if we put it in a conspicuous point with the tobacco can, it might be removed as a private souvenir by some subsequent visitor, and if we dropped it down deep into the pyramid it would probably be rusted through before another seventy years was past. We decided to send it to the Sierra Club for inclusion in its own archives or for placing in the Yosemite Museum."

By action of the Directors of the Sierra Club this record, with container, has been given to the Yosemite Museum. It is of interest to note that this record is similar to one which was taken from the summit of Mount Conness in 1917 by Walter L. Huber. The Conness record is in Yosemite Museum. It is for the next succeeding station of the Macomb survey (SCB, 10:3 (1918), facing p. 369.)

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CONQUEST OF "THE HAND"

The first ascent of "The Hand," in Pinnacles National Monument, was made in February, 1947, by a party composed of Robin Hansen, Dick Houston, and John Salathé. The climb starts at the chimney between the "Hand" and the "Thumb." By means of a prominent bush for an anchor, a rooflike ledge may be ascended toward

the west. The ledge is rough with good holds for hands and feet, but each hold must be thoroughly tested since the rock is unreliable. There are no good piton cracks on this pitch. From the rooflike ledge the route leads directly upward, with a small traverse to the right to bypass an overhang. On passing the overhang the route leads to the left until a gully is reached on a big ledge halfway up. After a short scramble a good belay position is reached with a manzanita bush for an anchor. Fourth-class pitches lie between this point and the summit. Three pitons were used on the ascent.

JOHN SALATHÉ

MOUNTAINEERING IN THE COAST MOUNTAINS OF BRITISH COLUMBIA, 1947

By RICHARD C. HOUSTON

Rock climbing is often poor in mountains which receive a good deal of snow. In the Coast Mountains, however, the summits are in general difficult and require proper equipment and technique. The rock is granitic for the most part and varies from massive formations to those of a more broken character. On none of our climbs was a rappel carried, but it was felt that a 200-foot reserve rope would have proved useful and would have greatly speeded the descents. Rock pitons were used on several occasions and should be available for use at any time. Place names and elevations were obtained from Munday's sketch map, and from the Harvard party already in the area. Several of the elevations were from a pocket altimeter carried by Ulf Ramm-Ericson. The full story of the trip is told elsewhere in these pages.

Mount Projectile (9,800).—First ascent by Hoyt and Ramm-Ericson, August 11, 1947. See pages 4-5.

Second Claw Peak (9,200).—Attempt by Hansen, Houston, and Hoyt, August 17, 1947: With an early morning start the trio cut straight across the Tellot Glacier to the base of the steep northeastern snow slope, leading to the bergschrund and rock of these sharp clawlike pinnacles. Hansen traversed to the left and upward on good firm snow and brought Houston to his position just under the bergschrund. With fair belay positions, Hansen crossed the thin snow bridge to the steep ice on the far side, and continued to the rock and safety. The route then followed the broken face which was extremely rotten with rock constantly raining down from the climber above. Traversing to the right and continuing upward the rock became increasingly poorer until a large steep chimney was reached that led to the notch between the Second and Third Claws. This portion of the climb involved fourth-class climbing and extreme caution owing to the loose rock. The chimney was made up of a series of vertical green bands all more rotten than the granite and offering few or no belay positions higher up. As we were still 100 feet below the notch, from which it was then some 200 feet farther to the summit, a short conference was held. Because of the condition of the rock and lack of full piton equipment we decided to retreat and direct our attention on the Third Claw then directly above us and about 100 feet lower than the Second Claw.

Attempt by Gates and Ramm-Ericson, August 22, 1947: Following the same route as the first party, Gates and Ramm-Ericson proceeded into the large rotten chimney and started upward. Continuing slowly on the green bands several pitons were placed for safety and a point 50 feet from the notch was reached. At this point the chimney became exceedingly rotten and because of the difficulty in placing necessary pitons the party retreated in favor of the Fourth Claw.

Third Claw Peak (9,100).—This peak, also known as California Claw, was ascended for the first time by Hansen, Houston, and Hoyt, August 17, 1947.

From the large rotten chimney under the notch of the Second and Third Claws we traversed to the left and downward for about 300 feet until we were somewhat to the left of the Third Claw. We started upward over the "vertical talus" as we called it, and alternately led the fourth-class pitches to within 50 feet of the summit, a large blocklike affair. With the aid of a shoulder stand Hansen placed a piton and a rope sling on the face and mounted into the sling. Several short steps placed him in a small sound chimney and a second piton was placed to offer protection on the final pitch to the summit.

Fourth Claw Peak (9,100).—The first ascent of this peak, also known as Stanford Claw, was made by Gates and Ramm-Ericson on August 22, 1947.

From the chimney under the notch beneath the Second and Third Claws, Gates and Ramm-Ericson traversed eastward to the base of the Fourth Claw. Five pitons were placed for safety on the north face and the blocklike summit was surmounted in short order. No attempt was made on the unclimbed Fifth Claw; photographs have yet to indicate a feasible route on this slender shaft.

Mount Shand (10,500), *east arête*.—This route was attempted by Cook and Parker on August 17, 1947. After a hurried departure from the Cataract Col high camp, the climbers discovered that they had taken the short climbing rope by mistake. This later hampered their climbing to some extent. They had little difficulty in crossing the small bergschrund to the south of the arête and quickly started up to the crest of the arête. Fourth-class climbing brought them to within one pitch of the crest, where they were confronted with a large smooth stretch. Two pitons for direct aid were necessary to overcome this pitch which put them on the ridge. Owing to the great amount of time spent with the short rope, the party decided to descend at this point.

The Harvard Route. Second ascent by Hansen, Houston, and Parker, August 23, 1947. On the return trip to base camp we decided to climb this prominent peak and enjoy one last look at the high country. The ascent was made up the long snow slope on the west side of the mountain. Hansen led this slope and was forced to cut about 30 steps in the hard snow. From the top of the snow the rope was removed and it was an easy stroll to the summit.

This peak was named for William Shand by the Harvard party, and first climbed by them in 1947.

Mount Heartstone (10,000).—Second ascent by Gates and Ramm-Ericson, August 17, 1947.

The ascent was made from our Cataract Col camp up the Western snow slopes leading to the broad ridge. By following the ridge the southwest summit was reached in 3 hours. It then became apparent that the lower of the two summits had been climbed, so a descent was made to the deep saddle between the summits. The party then proceeded upward to the higher northeast summit, taking an additional two hours. This peak was mainly a snow climb involving little difficulty.

Mount McCormick, East Peak, (10,300).—First ascent by Hoyt and Lippmann, August 22, 1947.

From the notch between the east and west peaks, the route led upward in a slight traverse to the south. Two pitons were necessary on a traverse near the summit. No cairn was found there. The ascent took 5 hours from the base of the peak.

Mount Dragonback, (10,700).—First ascent by Hoyt, Ramm-Ericson, Hansen, Houston, Cook, Parker, August 19, 1947.

This summit, named for its dragon-like shape, dominated the landscape northward from our high camp. In three ropes of two the party moved upward in the new snow of the previous day, via the southern slopes. After much labor, the small bergschrund was passed by a large snow bridge and we reached the notch just west of the final rock summit. Third- and fourth-class climbing led to the top via the arête after only 3 hours of climbing from camp.

Mount Eaglehead (10,800).—First ascent by Hoyt, Ramm-Ericson, Hansen, Houston, Cook, Parker, August 19, 1947.

After descending to the notch on Dragonback, we dropped down to the soft snow, still above the bergschrund, and kicked steps toward the easy north face of Eaglehead. After reaching the gentle slope we unroped and scrambled upward to the broad summit.

Mills Tower (10,000).—First ascent by Cook, Hansen, Houston, and Parker, August 22, 1947.

This peak is part of a prominent ridge near the middle of the upper Tellot Glacier and offers a commanding view eastward. We started about 10 A.M. from high camp and lunched at the base of the western rock arête leading to the summit. The rock became increasingly rotten and we left the arête for the west face which also was in poor condition. Houston led through a unique ice cave deep within the face which required the cutting of several steps. He came out again to the face at a large window-like opening, from which the peak received its name. Hansen continued the lead, surmounting three fourth-class pitches on rock. Above this point it was an easy walk to the summit. We reached the top at 3 P.M.

Mount Argiewicz (10,900).—First ascent by Gates, Hoyt, and Ramm-Ericson, August 21, 1947.

This peak at the head of the Tellot Glacier was named in honor of our fellow climber and friend, Artur Argiewicz, Jr., who was killed in action in Italy in World War II. The climb involved the crossing of a small bergschrund on the south slope and about 100 feet of fourth-class rock climbing near the top on the southern face.

East Tellot Peak (11,000).—Second ascent by Gates, Hoyt, and Ramm-Ericson, August 21, 1947.

The approach to this peak lies between the ridges dividing the Tellot Glacier at its upper reaches and a smaller unnamed NE glacier. The climbing began on the north face with a traverse to the right, to gain the notch between the two peaks, and continued over 50 feet of glare ice pitched at an angle of 60 degrees. One ice piton was needed for protection on this traverse. The remaining 200 feet consisted of easy fourth-class pitches leading to the summit.

Mount David Wilson, First Peak of Mount Serra (11,800).—First ascent by Hoyt, Ramm-Ericson, Hansen, Houston, August 20, 1947.

From the notch between Mount Serra and the Stiletto Needle on the Stiletto-Dentiform ridge, the route ran south over two exposed snow slopes. These were at a very high angle and made up of poor snow, but rock belays protected the lead on both. From the second snow slope the climb continued upward over large blocks, third class, traversing to the south arête. The route followed this arête closely, with many third- and fourth-class chimneys. Near the summit an exposed traverse westward was necessary in order to enter a prominent gully which continued to the top.

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Once in the gully the climbing difficulties ceased and the group quickly reached the summit. The view was disappointing because of an approaching storm. We descended during this short storm and arrived back on the Tellot after 7 hours on the peak.

From the summit of Wilson the way appeared open to the Second and Third Peaks of Mount Serra (both unclimbed). However the route would necessitate difficult rock climbing along the sharp ice-covered knife edges, which have deep notches and are of loose construction. A bivouac might be required to complete these ascents from this side. By following these arêtes, however, the steep avalanche slope on Mount Serra, where the accident to the Harvard party occurred, could be avoided.

Stiletto Needle (11,400).—First ascent by Lippmann and Gates, Bud King and Francis P. Magoun, III, August 20, 1947. (See pp. 8-9.)

Mount Dentiform, West Peak (10,600).—Second ascent by Lippmann and Gates, August 16, 1947.

From our Cataract Col camp the climbers pushed over the upper Tellot Glacier and approached Dentiform from the north. The steep snow on the northwest side provided access to the main rock face. Here a delicate traverse around a prominent bulge in the cliff was passed with the aid of two pitons for protection. After the traverse the route again led upward over fourth class pitches to the vicinity of the summit. The summit itself was reached after a short but interesting pitch on a steep lichen-covered face. This climb represented a new route and required about 10 hours.

Third ascent by Cook, Parker, Hansen, and Houston, August 21. This party followed the original Harvard route traversing across the northern snow slopes to the northeastern ridge. This ridge ended on the large snow patch near the notch between the East and West peaks. One short pitch brought the party to the lichen covered face that led to the summit. No pitons were necessary on the ascent. We descended to attempt the East Peak.

Mount Dentiform, East Peak (10 feet lower than West Peak).—First ascent by Cook, Parker, Hansen, and Houston, August 21.

We gained the notch which lies between the East and West peaks by climbing directly upward on rotten granite. From the notch we climbed up and along the western arête, which led to the summit, a neat four by four block overlooking the Tellot and Tiedemann glaciers far below. Most of the climbing on the ridge had been fourth class, on sound rock.

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ACCIDENTS

[During the past year two serious rock-climbing accidents have occurred, one to a private party climbing on the Upper Cathedral Spire in Yosemite Valley, the other during a regularly scheduled Sierra Club trip to Devils Slide, San Mateo County. These accidents mar an excellent safety record which local climbers have maintained over a period of many years, and consequently have been investigated and analyzed in detail by the Rock-Climbing Committee of the San Francisco Bay Chapter, and by the Mountaineering Committee. The following accounts of the accidents are presented with the hope of preventing similar occurrences in the future, and also to correct misinformation given in newspaper accounts.]

Spire Accident.—At 1:15 P.M. on July 12, 1947 Ulf Ramm-Ericson, Lawrence Taylor, and I stood on the small ledge below the Rotten Chimney on the Higher Spire. It was my turn to lead so I started up with double ropes, eleven carabiners,

and an assortment of pitons. Although the pitch is steep and slightly overhanging, the rock is broken and offers usable holds. About 20 feet above the ledge I found a horizontal army piton in the rock; after testing it, I snapped in and moved upward. About 10 feet above this piton I found a ring piton in place. Although I had another hand hold, I grasped the ring with my left hand and prepared to snap in.

At this moment I fell. Gravity acts so quickly that I don't know whether the piton came out or a foothold gave way. This latter possibility seems more likely to me. I shouted, "Fall," grabbed the rope above the knot, and spread my legs. My one piton came out after holding long enough to swing me in against the cliff. I struck a glancing blow with both feet and somersaulted back over the ledge. There about four feet away from the wall, and 30 feet below my belayer, and about 700 feet above the talus I stopped, thanks to the most competent belaying of Mr. Ramm-Ericson. I had fallen freely for about 60 feet.

After thanking my belayer, I managed, with tension from above, to climb to a small ledge where I could relax and remove the strain from my companions. This five feet took about five minutes as both my legs were broken and useless. Fortunately, by a combination of tension from above and from the left (south), Taylor and Ramm-Ericson were able to haul me around to a ledge where we could all relax and take stock. We had been in yodel communication with a party on the Lower Spire and they responded to our calls for help, which found them on the summit. Mrs. Herbert Conn went down to the valley for help while Herbert Conn and Al Hubert arrived at the Higher Spire in time to help get me down the last-not-so-steep pitch from First Base. In all, three rappels were made to reach the talus.

The descent took only four hours and was made as painless and swift as possible by the efficient help of my companions. The rangers arrived with a stretcher by 6:30 P.M. Ramm-Ericson had, by the way, not only run down to the Lower Spire to direct the Conn party but also went half way down the talus to meet and direct the rescue party. He carried the stretcher back by himself and arrived ahead of the relief party. The rescue party splinted my legs and started the incredibly difficult carry down the talus assisted by Hubert, Conn, Taylor, and Ramm-Ericson. About half-way down a relief party took over the job after giving me a welcome shot of morphine. Mr. Kittredge, then Park Superintendent, helped carry the stretcher part of this final stretch. We arrived at the road about 12:30 A.M., only five and one half hours after leaving the base of the Spire.

I cannot praise too highly the fast, efficient, and gentle work that the Park Service men did that night. One member of the party, Mr. Byrne Packard, suffered a broken ankle when a loose talus block smashed against his foot. Chief Assistant Ranger Homer Robinson was badly scratched and bruised.

This is my account of the accident. In conclusion I would like to correct a few mistakes unfortunately printed in the local newspapers and to discuss the cause of my fall. Our party was by no means inexperienced or improperly equipped for the climb. Ramm-Ericson had led an ascent of the Higher Spire just a month earlier and has had extensive climbing experience in both Europe and America. Taylor, as President of the Stanford Alpine Club and long-time member of the Sierra Club Rock Climbing Section, has a record of many ascents in the Rockies, the Sierra, and in Yosemite. My own record includes over 15 different climbs in Yosemite and ascents in the High Sierra, Rockies, and Teton.

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chological reminiscence because the reasons for such a fall lie in faulty judgment or in errors in estimating the situation. It is unfortunate that the circumstance of a fall, no matter how carefully recalled to mind, can never be reconstructed perfectly. For example, there is to this date, no agreement about which of the two ropes I was trailing actually took the impact of my weight. The following statements represent why I think I fell.

As I moved up from the ledge below the Rotten Chimney I could see a piton in place; this was about 20 feet above the ledge. When I reached this piton, it looked sound, and after testing it, I don't remember how well, I snapped in, took a brief rest on tension and moved above it. After a few feet I could see a ring piton in place and I decided to commit myself to reach this piton before starting the direct-aid-insling part of the lead. I had my left hand through this piton ring when I fell. During the climb, I can remember that I felt not particularly insecure or on the "ragged edge." The climbing was sufficiently difficult, however, that I felt better moving up with both hands on the rock than I would have had I tried to stop and place pitons with one hand. This decision not to risk the lesser danger of placing pitons and to accept the greater danger of climbing with only one piton between myself and my belayer seems to have been the error responsible for so long and injurious a fall.

When you are leading, you are quite alone in making decisions and therefore I don't feel that the fall can be attributed to anything but climbing difficult rock with insufficient safety margin in the way of pitons below. This was an error which has only become realized in my thinking after the accident; and it is well known how efficient is hindsight in comparison to judgments made on the spot. In any case, the error was my own and can in no way reflect upon my companions to whose skill and ability I owe my life.

I wish to repeat that the conduct of the Park Ranger Service, and of the volunteers who assisted them, was gallant and efficient in the extreme. To these men, also, I owe a tremendous debt of gratitude.

ALFRED W. BAXTER, JR.

* * * * *

[It should be added that although the belayer passed the ultimate practical test, in that he stopped a very heavy fall, nevertheless several points in belaying technique should be given scrutiny in the interest of preventing more serious accidents:

1. The leader outweighed the belayer some 70 pounds. The belayer should have the weight advantage wherever possible.

2. The belayer was not anchored, nor was the third man, who was tending a second rope to the leader. True, the belayer held, but this was in part due to his exceptionally good belay position. An anchor would have left him freer to assist immediately in the rescue, since he could have tied the fallen man's rope to it.

3. The belay rope was not allowed to run on either the initial or final impacts. That it should be allowed to run, so that a fall could be eased to a stop, has been stressed throughout all Rock-Climbing Section instruction since 1932. This might well have prevented the piton's jerking out, as well as the swing into the wall that is believed to have broken Baxter's legs. The static belay would almost certainly have broken any but the nylon rope, the elasticity of which substituted in part for the failure to allow the belay to slide.

4. The belayer should have urged the leader, since the leader forgot, to drive in for himself all pitons that could possibly be of critical importance in a fall. There is no other way to be sure enough of the value of a piton than to pound it in, listen to

the sound of it, watch the reaction of the rock, and know how much good hard driving the piton takes. No person who has pulled out many pitons (experimentally or otherwise) disagrees with this statement.

In spite of these comments, the belayer's actions, even if perfect, can at best be no more than corrective. A party's safety must always be primarily a function of the leader's judgment on the rock—of his anticipation of what he will think in hindhight. He must not let his margin get too thin.—D. R. B.]

Devils Slide Accident.—On August 17, 1947, during a scheduled trip by the Rock-Climbing Section to the sea cliffs at Devils Slide, John Hood, Ernest Irvine, and Harold Gray made the "Slackslide Traverse" from the lunch platform toward the beach in the next cove to the north. Finding the beach itself inaccessible because of high water, they were forced to return and decided to ascend vertically rather than to retrace their steps across the traverse. The vertical route has been taken occasionally by other climbers but was unfamiliar to Hood and his companions. Hood took the lead with Irvine belaying and placed three pitons for safety in the steep wall immediately above, after which he passed out of sight as the angle of the rock eased off. The climbing above did not offer great difficulty aside from the extremely unsound character of the rock (disintegrating granite) and no further pitons were used. When Hood had reached a point approximately 40 feet above his belayer and 20 feet above his last piton, he shouted "fall" and slid downward, landing on his head and shoulder on a steep slab near the other two members of the party. The rope jammed behind a point of rock some distance above and this eventually stopped his fall. No shock was communicated to the belayer.

Since Hood was unconscious from severe head injuries, climbers near by were summoned and rescue begun immediately by Phil Bettler, Bill Horsfall and others. A stretcher, obtained from the near-by Coast Guard Station, was lowered and Hood lifted with great difficulty to the top of the cliff. The personnel of the Coast Guard, the State Highway Patrol, and the County Hospital aided in the rescue, which occupied several hours. In addition a group of climbers which included Dick Leonard, Dave Brower, Raffi Bedayn, and Randy May was summoned from Berkeley and speeded the work in its later phases. Despite the best medical care, however, Hood died from his injuries in a hospital in San Francisco on the following day. The attending doctor stated that the skull fracture was so severe that no amount of speed in effecting the rescue could have saved his life.

Careful study of this accident has not revealed any important errors in climbing technique aside from the fact that the leader was too far above his last piton at the time of the fall. The exact cause of the fall is unknown. A simple slip may have occurred, the rock may have given way, or the rope from below jammed momentarily, throwing the leader off balance. Hood had made a number of climbs in Yosemite Valley and had a reputation for conservative judgment as a leader. His experience on unsound rock, however, was not extensive. The accident underlines the necessity for a greatly increased margin of safety in leading on unsound rock as compared to rock of a firmer character. Piton protection may often be necessary even though the technical difficulties are not great.

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Book Reviews

THE SIERRA NEVADA: THE RANGE OF LIGHT. Edited by Rodrick Peattie. Vanguard Press, Inc., New York, 1947. 398 pages, 26 illustrations, map. Price \$5.00.

This is not a guide book of the Sierra Nevada nor is it an ordinary book. It could not be since it is the work of nine contributors, all authorities in the subjects assigned to them. Many of these contributors are valued members of the Club.

In the opening chapter, entitled "Sierra Panorama," Weldon F. Heald has written perhaps the best short but comprehensive description of the High Sierra to be found anywhere. This description is necessarily general but, even so, it is hard to understand how so much material could be compressed within thirty-four pages. In the following chapter entitled "Empire in the Sky" he gives a brief but comprehensive narrative covering the history of the exploration of the Sierra, including the development of trails and their use. Both chapters are very well written by one sympathetic to the ideals of conservation, and reflect an enthusiasm for the High Sierra.

Mrs. Lester Rowntree contributes a chapter on the wild flowers of the Sierra and Dr. Richard Joel Russell has covered "Sierra Climate."

The chapter on the trees and forests of the Sierra could have been written only by one who truly loves the "Range of Light" as does Mary Tresidder. Along with excellent descriptions of the various trees and forests she shares with you, in retrospect, many vivid impressions, even the fragrance of various forests. Little wonder that she is able to do this since, as she says: "A good deal of my childhood was spent under the pines of Yosemite. There, in lieu of building sand castles and making mud pies, I found zoological exhibits of weird animals in the scales of the great plates of bark of the yellow pine and made 'coffee' from its pollen cones; I rode the elastic young trees as horses and got pitch all over my clothes; I found enchanted hollows in the deep woods."

François E. Matthes has contributed "A Geologist's View." Nothing that I can say is needed to assure the reader of the value of a statement by one of the greatest living geologists when writing about his favorite range.

Our own Sierra Club editor, David R. Brower, has offered an excellent outline of the development of modern skiing in the Sierra. He has traced this development from the days of Snowshoe Thompson (1856) to the present time. He has included a description of the terrain of the Sierra as affecting skiing, a review of development of ski areas and a brief statement on ski mountaineering.

One could wish that space had been available for more material on Mother Lode folklore by Idwal Jones. It is evident, too, that Bert Harwell was cramped for space when writing about "Some Birds of the Sierra Nevada." He wisely chose to list a large number of these birds and then to describe only his favorites of each zone.

Oliver Kehrlein has written the closing chapter covering climbing in the Yosemite region, including recent climbs which have resulted in surmounting the "inaccessible." This chapter covers some very thrilling climbs. As Mr. Kehrlein states, Yosemite is the Californians' Alps, Rockies, Andes and even in a more intimate way their Himalaya.

The volume is beautifully illustrated with 26 illustrations, also, in large measure, the work of Sierra Club members. A useful map was prepared by Weldon F. Heald.

WALTER L. HUBER

MOUNTAINS AND MEN. By Wilfrid Noyce. Geoffrey Bles, London, 1947. 160 pages. Many photographs and sketch maps. Price, 18s.

The climbing life and climbing thoughts of a young Englishman begin with his early experiences on the rocks of Wales, when at the age of eight years he was allowed up Manod. His climbing gains impetus with his first rock-climbing instruction, given by his older cousins who were "bitten with the rock-climbing madness." Then came the first introduction to real rock climbing, on Tryfan. For those who know those Welsh hills, and are familiar with the different routes, it must mean even more enjoyment to read of the climbs up the Monolith Crack, the chimney behind the holly tree of Holly Tree Wall, or the final crack of the Direct Route on Glyder Fach. But anyone who has climbed in any country knows what it means, and can appreciate the feelings of "Thank God I'm up: I've been praying long enough." He went through the natural stages of "climbing frenzy" and every holiday meant the hills in some form. One Easter, when still too young to be a member, he was allowed to stay at the Climbers' Club hut, Helyg, which was "hallowed with the mighty names of mighty men" and which he "expected to live up to itself unremittingly." It was a great disappointment to find no one leaping up early to climb, and no one to take him up something hard; and in the end he found himself taking another up a scarcely difficult climb! But the next day, he not only climbed with Menlove Edwards, considered the best rock climber of all, but met Geoffrey Winthrop Young, whose *On High Hills* has become a mountaineering classic.

Several seasons of climbing in the Alps, some guided and some not, gave him the experience and joy of snow and ice work, and the realization that if the Himalaya was twice the scale again of the Alps, he and his companions were nowhere on the mountain ladder. "But it did not matter. Only the Matterhorn mattered."

When he returned from the Alps in 1936 he and Menlove Edwards had to do some strenuous work for the Guide-book, and make all the climbs on Tryfan in Wales, measuring the pitches and mapping out the routes. Noyce credits the "tidying of it" to Edwards, and it was finished finally over the end of the year.

A bad fall—a foothold and rock belay both gave way—battered him rather badly. It was a long time before he was back again climbing, but from his fall he found another facet of satisfaction in the hills. He learned that he could enjoy the hills for themselves, without having that inner urge to get up this or that, to be able to roam over them without looking for a more interesting approach and without making a decision about which route to take.

Climbing again; and plans for further climbing on Ben Nevis at Easter. But during the Easter holiday, a boulder dislodged by melting frost turned aside to break the climber's leg, and once more he was out of the climbing. Then the war came, and the hills were possible for only an occasional escape.

Members of our mountain troops would find of interest the description of the toughening course for the Armoured Brigade, in Wales, where enthusiasm must be aroused for something repugnant and difficult for many. As one sergeant major, who had struggled part way up the North Buttress of Tryfan, said, "Do you think it possible sir, to hate a thing and enjoy it at the same time?" Later in India, in 1944, he saw the same sort of thing happen at the Aircrew Mountain Centre in Kashmir. This was primarily for the rehabilitation of air crews, but it was at the same time to stimulate them and give them desirable mountaineering experience. Climbing on

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ice and rock was to be a prime part of the program. "To think that people do this for fun" was one of the comments. But by means of dividing the men judiciously into those who wouldn't and those who might, and leading them gently via the valleys into the joys of the higher places, a surprising number were taught to like it.

Noyce was long enough in India to manage several expeditions to the mountains—to Garhwal in 1943, around Trisul, and again in 1944 nearer Nanda Devi, and finally a month's trip into Sikkim. He learned to admire and respect the Sherpas and the Dhotiyals, who were responsible for his being able to take the trips at all, and one chapter is a tribute to Angtharkay, the Sherpa who was with him on the Sikkim trip, and who showed such ability, loyalty, and character.

The philosophy of climbing fascinates Wilfrid Noyce, and he cannot resist thinking it out more fully in the chapter entitled "The Anatomy of Pleasure." He gives his reasons, as have many, for why we climb, and the answer seems to be, as always (although he does not say it that way) that we love it and cannot help ourselves. It is enjoyable reading, this slim but pleasant book, perhaps chiefly because of the enthusiasm and pleasure of the writer in experiencing those joys we'd all like to experience more.

H. T. P.

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EXPLORING OUR NATIONAL PARKS AND MONUMENTS. By Devereux Butcher. Oxford University Press, New York, 1947. 160 pages. Price \$1.75. Prepared under the auspices of the National Parks Association.

"Every park is an outdoor university," and Devereux Butcher has provided an excellent guide to the parks and monuments. Beautiful photographs supplement the factual information about each. The location, chief features, brief geological background, the trees, animals, and birds for each area are described clearly and concisely. The accent on conservation in this book reflects the keen understanding of conservation problems by Mr. Butcher, Executive Secretary of the National Parks Association. The legend under a scenic photograph of wild flowers states that "Flower carpets in the alpine meadows of Mount Rainier and other parks are enjoyed by thousands of visitors," but adds, in warning, "Livestock interests have urged opening the parks to grazing and feeding these flowers to cattle." In describing the beauty of the Olympic National Park the author comments: "This primeval park has been coveted by local lumber mills . . . public opinion has stood rigidly opposed to such desecration . . . only by the constant vigilance of an informed public can despoiling activities like these be prevented." This book is a fine, companionable guide for anyone planning to visit park areas where, as Mr. Butcher concludes, "People can come in contact with primeval nature and become acquainted with undisturbed plant and animal life and observe the wonders of earth history."

JACQUELINE WATKINS

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DEATH VALLEY AND ITS COUNTRY. By George Palmer Putnam. Duell Sloan & Pearce, New York, 1946. 231 pages. Price \$2.75.

DEATH VALLEY HANDBOOK. By George Palmer Putnam. Duell Sloan & Pearce, New York, 1947. 84 pages. Price \$2.00.

Just when one thinks that everything that could possibly be written about Death Valley has been published, out comes another book on that fascinating region. George Palmer Putnam has done a good job in *Death Valley and Its Country* and in the more recent companion book *Death Valley Handbook*. In the latter he deals with

the climate, plants, birds, mammals, rocks, and chronology of the valley, all in a brief manner. The former contains many highly entertaining anecdotes, although it grieves some of us older "desert rats" to realize that many of the residents whom we met have since died, among them Indian George, Shorty Harris, Pete Auguerreberry, and Chris Wichts, and of a more recent period, Norman Westmoreland, Mrs. Agnes Bennett, and Albert Johnson.

One story tells of Alexander Woolcott's eagerness to see Scotty's Castle because he had understood that his admired friend Frank Lloyd Wright had been the architect. So he was driven to Grapevine Canyon where he encountered Albert Johnson (Scotty's "angel") on the road. When told that Wright's plans had not been used, "the retreat from this esthetic pilgrimage was made in disillusioned silence."

The popular impression is that Death Valley National Monument consists merely of the geographic depression named by Manly in 1849, whereas there are 2,980 square miles in the monument, which exceeds in size all other similar national areas in the continental United States except Yellowstone. The monument ranges in elevation from 279.6 feet below sea level at Bad Water, to 11,045 feet above at Telescope Peak.

Putnam refers to the absence of sound as being a distinctive feature of Death Valley, although one thinks the increase in highway and air travel will tend to diminish that silence. The valley is the result, not of erosion, like the Grand Canyon, but of internal disruption. Former Park Naturalist Donald Curry called it the most remarkable assemblage of geological phenomena to be found in any like area, for almost the whole of recorded time is represented in the Valley itself and the surrounding ranges.

He has one delightful section relating to "the matrix in the sand that records what the humble tiny people are up to each night when you may not see them. The story is set down precisely on pages which the breezes erase clean by day, ready to receive fresh confidences in the new night." Reference is made to the modern hobby of rock collecting, and his chapter "Star-spangled Gem Basket" is the best summary yet to appear on this new and interesting diversion. After telling of the gems of the desert lands, he speaks of the "gems of the sky," the stars, and he quotes J. B. Priestley to the effect that the desert is a place of geology by day and astronomy at night. Then, surprise of surprises, he divulges that there are water ouzels at Darwin Falls in the Panamints!

There is also a tantalizing revelation that one of the most interesting areas of the Monument cannot yet be thrown open to full public enjoyment, owing to the lack of personnel to guard its natural exhibits. One surmises how a little of the money now spent on other and nonproductive projects could be utilized in Death Valley National Monument and other park areas. (Congress, please note!)

One minor regret is that maps, such as make up the end papers of this book, seldom show mileages to the places named on the margins, for the guidance of prospective tourists. Also, *Death Valley and Its Country* contains no photographs of the region. Yet, even the best of pictures fail to convey the appeal that Death Valley has for its visitors, especially its campers. As an English explorer once said, "No incidence of travel can recall pleasanter memories than a campfire, that little circle of intimate and peaceful light which seems to concentrate within itself the joy and romance of travel." For those of us who love the desert this holds especially true of Death Valley and its country.

JAMES H. BARBOUR

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KINGDOM OF ADVENTURE: EVEREST. By James Ramsey Ullman. William Sloane Associates Inc., New York, 1947. 401 pages, maps and illustrations. Price \$4.75.

Ullman, the author of *High Conquest* and *White Tower*, has collected writings by participants in the Mount Everest adventure from the various books and journals in which they were first published. Using these, with comments of his own, he has furnished background and continuity to one of the finest of human adventure stories, the attempts to climb the world's highest summit. His technique succeeds admirably in bringing the story of Everest in all its force and drama before the general public, for no matter how skillful or sympathetic, no author could match the terse paragraphs of the men who actually experienced the bitter winds on the North Col or the exhaustion and exaltation of the climbs to the high camps.

Many of the Everesters, like George Leigh Mallory and Frank S. Smythe, were writers of high ability; others had the sensitivity and love of the mountains to make their words powerful in conveying not only the facts of the climbs but also the many intangible emotions, which for the climber, make mountaineering the only sport. Perhaps the only criticism of the book is that Ullman does not carry his plan of quoting others far enough, and too frequently inserts comments of his own into the brilliant commentary of the Everest men themselves.

The book covers the story of Everest from its discovery in 1852, by an Indian surveyor working for the British, to the wartime flight over the peak by Colonel R. L. Scott, Jr., in 1942. The story is told against the entire background of Himalayan exploration and mountaineering the world over, for as Mallory might have said it, the attempts to climb Everest are only a part of the vast story of man's efforts to reach high places and, in so doing, conquer fear, weakness and selfishness in himself.

Ullman has wisely included chapters on the various technical problems connected with high-altitude mountaineering and cites, pro and con, arguments on matters of diet, use of oxygen, and the advantages of small over large expeditions. The arguments of Eric Shipton and H. W. Tilman in favor of small mobile parties will give renewed hope to those who dream of some day climbing in the world's greatest range.

The chapter on mountaineering motives and climbing philosophy is no more nor less effective than countless other discussions of these two ineffable topics; it does, however, give insight into the attitudes of some of the greatest mountaineers toward their sport and toward the mountains.

In many ways, *Kingdom of Adventure* is valuable as a reference work, for it contains appendices giving biographical data on the principal Everest climbers, a chronology of the Everest expeditions, and a well-rounded bibliography of mountaineering literature. The many fine photographs, including the highest picture ever taken on the earth's surface, and the useful data in the appendices make this an indispensable item for the mountaineers.

ALFRED W. BAXTER, JR.

SKIING THE AMERICAS. By John Jay. The Macmillan Company, New York, 1947. Price \$4.95.

John Jay breezes through the story of skiing and skiers with a verve and dash that keep the reader tensed forward and awaiting a slow-up or let-down that never comes. The only item he leaves untouched is "how to ski" and unconsciously you are glad he omitted it. Its inclusion might have slackened his speed and allowed you to put

the book down until the morrow. As it is, he packs 257 pages of informative ski dope and thrills (including 100 of his finest pictures) with provocative continuity, swinging delightfully from Maine to California and from Canada to Chile. His tempo, throughout, reminds us of the typical skier who tries to crowd in as many runs and cover as many areas as possible in a single winter season.

He starts casually and conversationally to answer that often-asked question, "Are skiers crazy?" With that out of the way, he checks for a few pages to flit through 6000 years of history from China down to the 1948 Olympic team. Then he lets loose and the race is on. And you're with him every inch of the way, for skiing is a participant sport and there is no place for sideline critics. It is only after you have closed the book, breathless, and relax for a final appraisal that you realize that you have been too busy keeping up with the author's mad pace to question any of his statements. It is only then that you realize what a small part California—included in the Rockies—plays in this great sport with its potential 15,000,000 skiers.

He has an up-to-the-minute section on what to wear, and even we far-westerners can preen with satisfaction. He suggests where to go and makes each place more alluring than the last. He tells us how to go there and what to do when we get there, both before and after skiing. He includes ski songs—yes, American songs—and how to sing them; ski week ends and how to get the most out of them; ski vacations that will make the rest of the office green with envy; spring skiing, summer skiing and even all-year 'round skiing—not quite suggesting that we chuck the job and quit earning a living.

He devotes a chapter to personal reminiscences of the 87th Mountain Infantry and the 10th Mountain Division, from Lewis and Hale to Kiska and Belvedere, and pays tribute to many men well known to us all and to those heroes who never again will be seen on the slopes. He also tells of the hectic birth and fantastic trials of the Weasel and makes us long to own one.

Our only regrets are that Jay should have visited Badger Pass on an off day when swarming snowbunnies predominated on the slopes and that he got the wrong slant on national-park conservation problems in Yosemite. We can readily overlook his minor inaccuracies about Snowshoe Thompson, Otto Lang, Torger Tokle, the Sugar Bowl, in deference to the great wealth of authoritative data he has included in the balance of the book.

After reading the book, one feels with Lowell Thomas, who wrote the introduction: "John Jay takes us to nearly every ski spot in the Western Hemisphere. I thought I had covered most of them. But after this journey with Jay I realize I haven't been anywhere."

OLIVER KEHRLIN

PLANT EXPLORER. Douglas of the Firs: A Biography of David Douglas, Botanist. By Athelstan George Harvey. Harvard University Press, Cambridge. 1947. 290 pages, illustrated. Price \$4.00.

It is now well over a hundred years since David Douglas lost his adventurous life. On a visit to Hawaii he fell into a pit in which a wild bull had been caught and was gored to death. No comprehensive account of his life—a story almost without parallel in early American history—existed before the advent of this book. Parts of his journal had been published and brief accounts could be found in historical and scientific journals, but none of the material was readily accessible for public reading.

David Douglas was a Scotsman, a member of an ancient and happy profession, a

plant explorer. Like his countryman John Muir he was a wilderness lover; each made an enduring contribution to the interpretation of the natural wonders and beauty of the primeval West. In 1824 Douglas, under the auspices of the London Horticultural Society, sailed from England on a Hudson's Bay Company ship bound for the Columbia River. He landed at Fort George (Astoria) after an eight-month voyage around Cape Horn. His first sight of the magnificent forests fired his imagination, and immediately he began his great odyssey. Based at Fort Vancouver, the enthusiastic botanist ranged the Columbia River country collecting plants, and, as a by-product, adventures. Among his first discoveries was the tree later known as the Douglas fir, "one of the most striking and truly graceful objects in Nature." He saw Indians eating the nuts of a strange pine, which they told him grew far to the south. Excited by their accounts of this mystery tree, he ventured into a trackless wilderness, almost unknown even to the trappers. After enduring great hardships, he finally located "a most beautiful and immensely large tree." He had discovered the sugar pine, and to him it was the one great treasure in his collection. It is interesting that it also became the tree best beloved by his fellow enthusiast, John Muir.

In two years of wandering, Douglas explored the far reaches of the Northwest. From the Columbia River basin, excursions were made into the Puget Sound area, into southern Oregon and over into the Blue Mountains of northeastern Oregon. During this time he collected indefatigably, finding and naming countless new plants. Our great botanist, Willis Linn Jepson, writes, "Hundreds of new species, our most familiar plants, were based on the Douglas collections, study of which is not exhausted to this day." His return to London was an adventurous journey in itself—up the Columbia River with a party of Hudson's Bay voyageurs, on foot over Athabaska Pass, and across Canada to York Factory on Hudson Bay, and thence home by sailing ship.

In 1829, Douglas again voyaged to the Columbia River to renew the life he loved, roaming the wilderness in the search for plants. His insatiable quest finally brought him to California. Sailing down the coast, he landed in Monterey. From there he made numerous excursions into the countryside, and went as far south as Santa Barbara. Many of our best known California plants were his discoveries; among these were the Santa Lucia fir, *Pinus sabiniana* (Digger pine), *Pinus monticola*, and hosts of others, which still bear the names he bestowed upon them.

This is a book of uncommon adventure; its pages transport one into the West of virgin forests, into a land still untouched by man's devastating hand. It is a tribute as well to a courageous and simple man, whose life work has left a legacy of inspiration to future generations of wilderness travelers.

RALPH MOCINE

YOSEMITE AND KINGS CANYON TROUT. By Charles McDermand. G. P. Putnam's Sons, New York, 1947. xii+178 pages. 16 photographs, map end papers. Price \$3.50.

Charles McDermand has added another fine volume to the library for Sierra trout fishers, in this most recent account of the piscatorial pastime in the territory of Yosemite National Park, Emigrant Basin, and Kings Canyon National Park. His introductory statement that "... much of this water is so seldom visited that a man may fish for days without seeing another angler," is cheering to conservationist as well as fisherman. Indeed, Mr. McDermand seems to be both, as he reports frequent

"leaving for seed" of trout rare in the waters where they were caught. His fishing companions find this attitude infectious and soon are echoing his sentiments, "Turn him loose, Mac! He fought hard and deserves to live. We don't need him to eat, and fish seem scarce here. Leave him for seed like you left the golden in Townsley this morning!" What better statement of true sportsman and conservationist attitude could be made!

Of great value to the novice fisherman and of interest to the experienced packer are the two chapters of information on back packing, food, tackle and methods of Sierra trout fishing. An alphabetical list of the lakes in the Yosemite National Park and in the Emigrant Basin is included (those for Kings Canyon National Park were given in *The Waters of the Golden Trout Country*) with the breeds of trout inhabiting them, the altitudes and locations, and experienced comment for anyone planning a trip to those areas.

This is an invaluable volume for Sierra fishermen, and highly interesting to a mere lover of the Sierra who doesn't know a golden trout from a pickerel. We hope that Charles McDermund's dream of "next year . . . the fabulous Inyo-Mono country, where a man could probably fish a different lake every day for six months and never visit them all" will soon appear on bookshelves to add still another volume to this colorful and satisfying collection.

B. N. B.

ALONG SIERRA TRAILS: KINGS CANYON NATIONAL PARK. By Joyce and Josef Muench. Hastings House, New York, 1947. 101 pages, 146 photographs, map. Price \$2.50.

Considering the fact that for over fifty years members of the Sierra Club have been exploring and enjoying the Kings River country, scaling its highest peaks, walking beside its sparkling waters, camping in its exquisite meadows, and trying to convince the right people (1) that it should be a national park, and (2) that it doesn't need any improving, they need no introduction to this superb mountain region. But they do love to be reminded of it; and the Muenches' attractive little volume of photographs is almost certain to remind any Sierran of happy days spent up around the headwaters of the Kings and set him to thinking that maybe he'd better be getting some new soles on his boots.

The book is made up of 146 photographs reproduced in sheet-fed gravure, with brief text that touches upon the history of the park, mentions the approaches and passes, and describes with great enthusiasm beauties and attractions along the trail. In spite of several references to various scenes as being "Himalayan," the photographs are, from lovely polemonium to the General Grant Tree, from Tehipite's polished dome to Darwin's jagged spire, Sierran, definitely, delightfully, appealingly—and fortunately—Sierran.

B. S.

THE DICTIONARY OF CALIFORNIA LAND NAMES. By Phil Townsend Hanna. Automobile Club of Southern California, Los Angeles, 1946. 360 pages. Price \$5.00.
1,000 CALIFORNIA PLACE NAMES. By Erwin G. Gudde. University of California Press, Berkeley, 1947. Price \$1.00.

Azusa, Mount Goddard, Red Dog, Rough and Ready, San Geronio, Young Lake! Where are they? Perhaps you have been there, but the odds are you don't know where the names came from. If you do, then you enjoyed your visit all the more because

such information explained to you many phases of the present condition of the place, and enhanced its long faded past.

Phil Hanna is editor of the Southern California Automobile Club's *Westways*, and consequently organized his book along the lines of the names on California travel maps. The one exception is the detailed information given on about 500 Spanish and Mexican land grants in the state. The reason for including this is that many of our best known names originate from those old Spanish names.

Although many names are not included, such as El Cerrito, Albany, Orinda, and Walnut Creek in the Bay Area, this is the most inclusive and authentic work on California place names published to date. About 3,400 names are listed, many of which have become almost extinct, but the author hopes that this book may preserve much of this vanishing information. Its use will certainly heighten the fun and interest in traveling in California, and give an understanding of the state's background as viewed through the history of its place names.

A list of sources consulted is given in the concluding pages. Included are such valuable place-names books as Francis Farquhar's *Place Names of the High Sierra*, now out of print, Nellie Van de Grift Sanchez' *Spanish and Indian Place Names of California*, and Professor Kroeber's *California Place Names of Indian Origin*.

"The story behind the naming of important mountains, counties, rivers, cities, lakes, capes, bays" is the way the cover describes this little paper covered booklet, 1,000 *California Place Names*, which is a prelude to the momentous and comprehensive *California Place Names* now being compiled by Professor Gudde and his assistants and advisors at the University of California. The booklet is an appetizer to whet the taste and desire for the major publication which will probably be off the press sometime in 1948.

The amazing part of the little booklet is that when you use it to look up almost any California place name that comes to mind, you find it there. How, out of the thousands of names, the author was able to make such an excellent selection of those which arouse the most curiosity is something probably only the author could explain.

Professor Gudde has not stuck to the cover description, but wanders so afield as to give such colloquial non-place names such as abalone, arrastre, hackamore, mesquite, and pinto. He tells us not only of the ancient names such as Carmel, Tomales, and Tamalpais, but explains such modern ones as Treasure Island and Fort Ord; and he also gives the natural sound spelling of those names whose pronunciation might be questioned.

This booklet is the handy kind to be thrown into a knapsack or dashboard drawer. 1,000 *California Place Names* represents the most authentic piece of research on these particular names done to date, and is worth anybody's dollar.

PHILIP N. MCCOMBS

THE COMPLETE SKI MANUAL. By Eddie Hober and Norman Rogers. Prentice-Hall, Inc., New York, 1946. x+137 pages. Price \$3.00.

The authors of this little book really made it a complete manual in terms of scope of subject. In 134 pages they deal with the history of skiing, manufacture of skis, selection of equipment, waxing, ski instruction, skiing fundamentals, training for competition, racing, jumping, touring, ski mountaineering, and first aid. The result is a sketchy coverage of the entire subject which should be interesting to a novice

trying to get a general impression of the origin and scope of the sport. A beginner trying to learn ski technique, however, would find the descriptions too brief to follow, and if he succeeded, he would find later that he had, for the most part, learned the ski technique in use in the early 1930's. The authors show a commendably high regard for the merits of touring, but their ski-mountaineering advice is far too brief to be of real value.

ALEX HILDEBRAND

ONE DAY AT TETON MARSH. By Sally Carrighar. Alfred A. Knopf, Inc., New York, 1947. 240 pages. Price \$3.50.

A marsh, nestled at the base of the Teton Mountains, is the setting for Sally Carrighar's *One Day at Teton Marsh*, a story for which she spent months, many of them alone, in the Jackson Hole region watching the animals which she describes. Her book reflects keen observation and patient hours of research. Her delightful way of writing became familiar to many through *One Day on Beetle Rock*, and, as Edwin W. Teale said of *Beetle Rock*, this too is "a front-row addition to any shelf of nature classics."

The story is woven around two main subjects: first, the beaver and his dam which made the marsh possible; second, an equinoctial storm which partly destroys the dam and in its wake brings the first winter snow. All the animals are those of the marsh, and all are dependent on the fate of the dam. Each chapter, devoted to one animal, treats the storm and its effect differently, depending on the importance it has in the life of this animal. For example, the storm is not too important to the osprey, but it is a life-and-death matter to the trout. It has a drastic effect upon an otter, who loses his parents, brothers, and sisters with whom he would normally have stayed another year. Migration is a part of the story of the American merganser, hibernation of the leopard frog, and camouflage of the varying hare. There are interesting stories, too, of fish and snails, of the leech and of the mosquito, all helping to show the complicated interrelationship of all the animal kingdom. Also of special interest to the conservationist are the chapters about the mink and trumpeter swan. The excellent illustrations by George and Patricia Mattson add much to the book. The story is one which will give great enjoyment to all who like our wilderness areas and the animals living there.

JOANNE TAYLOR

HIGH HEAVEN. By Jaques Boell. Paul Elek Publishers, Ltd., London, 1947. 126 pages. 32 photographs, 12 diagrams. Price 12/6.

Boell might be you or any mountain climber describing various climbs in the High Sierra or Yosemite. The difference—he is French with his locale for week-end climbing in the southeast corner of France. Here are his Aiguille des Arias (11,149 feet) and other 10,000 to 13,000 foot peaks. He describes in detail climbs he and friends have made during the 1930's and the years while France was under the German yoke. The book is illustrated with excellent diagrams of each ascent and numerous photographs of his beloved heights. One hoping to visit France will find *High Heaven* a good guide for scrambling in French Alps. However, the author in his great enthusiasm overburdens the text with comparisons. Perhaps by reading a chapter now and then the reader would not feel quite so overwhelmed by simile and metaphor.

POLLY DYER

THE TETON MOUNTAINS: THEIR HISTORY AND TRADITION. By Nolie Mumey. *The Artcraft Press, Denver, Colorado, 1947. 462 pages.*

Many interesting facts about the Teton Mountains can be found in this book by a man who knows the region intimately and who has spent many years of research on it. A description of the range, its peaks, glaciers and trails gives the background for subsequent chapters on its history, fully illustrated with photographs and reproductions of old prints, portraits and engravings. Most of the photographs of the mountains are disappointing. The book lacks literary style, and is printed on unattractively thick paper, in a very heavy format. There is a full bibliography. H. T. P.

MAMMALS OF NORTH AMERICA. By Victor H. Cahalane. *The Macmillan Co., New York, 1947. 646 pages. 29 pages of references. Index. Price \$7.50.*

Much has been written in scientific treatises on the mammals of North America, but we have lacked an authentic, popular book which can be read by the public and which covers that whole field. Mr. Cahalane has supplied this want, admirably. This is not a book that the absolute scientist will find indispensable, since he could dig out this same information from the wealth of scientific data available to his profession. But here, data are collected for an educated public, and presented readably without losing scientific accuracy. The text is informal and often humorous, and was kept accurate with the help of an exhaustive reference of scientific treatises. The illustrations by Francis Jaques are dramatic, bold, and occasionally misleading, where an artistic effect of shade or light may be mistaken for color pattern. Mr. Cahalane has done a difficult piece of work well. Most Sierra Club members will not only enjoy reading his book, but will also put it on their library shelves as a long-needed reference.

MILTON HILDEBRAND and B. N. B.

BREAKING NEW GROUND. By Gifford Pinchot. *Harcourt, Brace and Company, New York, 1947. xviii+522 pages, illustrated. Price \$5.00.*

The autobiography of the man who brought practical forestry to this country is also—naturally enough—the history of the United States Forest Service. Gifford Pinchot gives us that dual story—of his father's suggestion that set him on a pioneering road, of his European studies and his first small attempts to induce Americans to practice forestry, of the growth of the Forestry Division into the Bureau of Forestry, and of the Bureau into the Forest Service, and finally of the sound establishment of a conservation movement. Under changing titles but with the same purpose, Pinchot was in charge of government forestry, from 1898 until President Taft dismissed him, as an aftermath of the Ballinger storm, in 1910.

Throughout that time he worked earnestly for a practical policy which should lie between early American wastefulness of "inexhaustible" forests and the locking up of renewable resources. Pinchot has many a story to tell, of outdoor adventure, of political battles, and of the growth of a national conservation conscience. His devotion to and pride in the Forest Service is expressed in the dedication of the book: "To the men and women of the Forest Service, whose courage, devotion, and intelligence have made it and kept it the best organization in the Government of the United States."

C. E. M.



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